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ABSTRACT

The plea of this bulletin, the second and full revision of The Problems Approach and the Social Studies copyrighted in 1955 and 1960, is for teachers to do more with the reflective method in their classrooms. It draws upon the latest and most pertinent insights distilled from research, theory, and practice associated with reflective thinking; deals with specific whats, whys, how, and whens of problem solving in social studies at the elementary and secondary school levels; and, makes a case for increased use of this inquiry method and type of program organization. Specific suggestions are offered that range from the question-answering stage to full-fledged problem-solving units. Chapter 1 by Maurice P. Hunt and Lawrence E. Metcalf introduces the reader to the theory, philosophy, and psychology of the problems approach. Fannie R. Shaftel, Charlotte Crabtree, and Vivian S. Sherman discuss problem resolution in the elementary school. The third chapter on the junior high school is provided by William E. Gardner. Robert E. Jewett treats the senior high school. Trends in the use of reflective teaching, the subject of chapter 5, have been identified and analyzed by Emily S. Girault. Chapter 6 on teaching resources has been prepared by Jack W. Miller. (Author/SBE)

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PROBLEM-CENTERED SOCIAL STUDIES INSTRUCTION

Approaches to Reflective Teaching

Richard E. Gross and Raymond H. Muessig
Editors

SO 001 357

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Foreword

We are witnessing today a sincere desire on the part of many young people to become involved in the problems of society that surround them. They are strongly motivated to come to grips with social realities. They want "a piece of the action." There is a growing impatience with school studies that cannot be or are not related to social action. Viable programs of social studies education do not, therefore, lead young people away from the thorny thickets of human problems but, instead, provide means for them to learn how to deal with those problems in responsible and intelligent ways.

It is not the hope of educational planners that through problem study, learners will "solve" complex social problems. To seek only solutions would be futile and unrealistic besides being misleading to the learners. What seems to be important is the process of the search itself. The attention given to inquiry strategies in curriculum and instruction during the past decade provides convincing testimony of the value of problem solving as an educative process.

Problem study, conflict resolution, and decision making must be continuing concerns of those involved in social studies education. These interrelated processes are basic to the education of people for life in a free society. For the social studies curriculum, problem study serves as a coalescing agent, welding together knowledge, skills, values, and social action in a rationally-based attack on social issues. It is to these matters that the authors of this document address themselves.

The National Council for the Social Studies wishes to express thanks and appreciation to the editors, Richard E. Gross and Raymond H. Muessig, and to the authors who contributed chapters to this important publication.

JOHN JAROLIMEK, *President*
National Council for the Social Studies

Preface

Confucius once counseled, "Learning without thinking is labor lost; thinking without learning is perilous." Thus, 2500 years ago, a teacher put well the juxtaposition between knowledge and the means of attaining it. Unhappily, in the stream of Western learning, this essential alliance has too commonly been overlooked. In spite of the examples of great teachers such as Socrates, the entity of skills and wisdom has not been demonstrated in anywhere near enough classrooms. The Medieval scholar, Abelard, shook the complacency of his colleagues by stating: "By doubting we learn to inquire; by inquiry we learn the truth." But today "truth" is still too regularly proclaimed and indoctrinated. This volume is in the long tradition of prophets and works that have crusaded to bring the skills of open-ended problem resolution to the heart of the educational process.

This Bulletin began as a second and full revision of an earlier edition of *The Problems Approach and the Social Studies* that was copyrighted in 1955 and edited by George L. Fersh. The first edition was well-received and was out of print in less than four years. The Publications Committee of the National Council for the Social Studies asked Richard E. Gross and Raymond H. Muessig to edit a limited revision of *The Problems Approach and the Social Studies,* which was copyrighted in 1960, so that copies of this Curriculum Series Number Nine publication could be made available as soon as possible. Again, the Bulletin met with a favorable response, and a second revision was indicated. This time, however, the editors were requested to guide the writing and organizing of a thorough revision. Only one of the original chapters has been retained and rewritten. The other five chapters will have their debut in this volume. Since the present publication is essentially a new work, it has been decided to christen it with a timely title: *Problem-Centered Social Studies Instruction: Approaches to Reflective Teaching.* The new title reflects changing terminology as well as serving to identify clearly the emphases of the book. It is hoped that this 1971 version will be greeted as enthusiastically as were its two predecessors and that it will be even more useful.

Problem-Centered Social Studies Instruction draws upon the latest and most pertinent insights distilled from research, theory, and practice associated with reflective thinking. This publication deals with specific *whats, whys, hows,* and *whens* of problem solving in social studies at the elementary and secondary school levels and makes a case for the increased use of this method and type of program organization. Teachers have long known that when the learner is actively involved in a consideration of his problems and those of others learning can be facilitated. This Bulletin points out that the problems approach is not a new proposal but that the breach between theory and practice is still disappointing.

These are times which demand various abilities and which present numerous opportunities to engage in vigorous, meaningful, creative, sensitive, and critical thinking. Required particularly are skills[1] such as

- recognizing the existence of problems,
- defining problems clearly, precisely, and carefully,
- framing understandable, useful, testable hypotheses germane to problems,
- locating data related to problems and their respective hypotheses,
- separating facts from opinions,
- distinguishing between relevant and irrelevant data,
- holding reservations or doubts about statements that are unsupported,
- perceiving that there may be a number of tenable or acceptable ideas and opinions associated with a particular problem,
- identifying differing frames of reference regarding problems and stating these viewpoints in an objective, unbiased fashion,
- inviting and considering thoughts, beliefs, and evidence contrary to one's own predispositions and data,
- reaching tentative conclusions and realizing that many significant problems cannot be solved for all time,

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[1] Adapted from Raymond H. Muessig, *Teacher's Guide for Discussion Pictures for Beginning Social Studies.* New York, Evanston, and London: Harper & Row, Publishers, 1967, pp. 20-21.

- questioning simple solutions to complex problems and taking a long view on difficult, perplexing personal and social issues,
- anticipating some consequences that may grow out of one's commitments and decisions,
- spotting contradictions in statements, data, and solutions,
- discriminating between problems that can be handled in a factual, objective fashion and those that are involved with impressions, feelings, and *a priori* leanings,
- and revising, altering, or abandoning ideas, opinions, beliefs, attitudes, and values that are unsupportable, unworkable, or lacking in human and humane satisfactions or that fail to serve one in new circumstances.

The problems approach makes a fundamental contribution to the nurture of the skills just enumerated, for they are essential ingredients woven into the fabric of systematic inquiry. The plea in this Bulletin for each of us to do more with the reflective method in our classrooms is supported by specific suggestions that range from the question-answering stage to full-fledged problem-solving units. New and experienced teachers should find examples and explanations in this Bulletin geared for their present stage of development and applicable to their unique classroom environment.

This Bulletin is both explanatory and exploratory. The authors propose no panacea, or final answer, or cure-all. This Bulletin asks some questions which have not been answered to date and proposes a number of tentative answers to existing curricular and instructional problems. It has justified one of its major purposes if it serves as a point of embarkation or springboard to further efforts in this area.

The writers who have contributed to this Bulletin are actively engaged in the educational process. They bring varied points of view and also depth of experience to the task. Differences in orientations have been encouraged and preserved because problem solving is too complex a phenomenon for unanimity.

Chapter I by Maurice P. Hunt and Lawrence E. Metcalf introduces the reader to the theory philosophy, and psychology of the problems approach. Fannie R. Shaftel, Charlotte Crabtree, and Vivian S. Sherman have revised their chapter on problem resolution in the elementary school which appeared in the 1960 edition of *The Problems Approach and the Social Studies.*

The third chapter on the junior high school and the problems approach is provided by William E. Gardner. Robert E. Jewett treats the problems approach in the senior high school. Trends in the use of reflective teaching, the subject of chapter 5, have been identified and analyzed by Emily S. Girault. Chapter 6 on teaching resources for the problem-centered instruction has been prepared by Jack W. Miller. For references and resources on the topic previous to 1960 see the earlier NCSS Bulletin, *The Problems Approach and the Social Studies.*

Since this entire project is a labor of love, the editors cannot express adequately their gratitude to all of the chapter writers and others who have participated in this endeavor. Each of these persons would be more than repaid, however, if he or she were to know that his or her suggestions have been helpful and that through this effort problem-solving techniques are receiving increased attention in America's schools.

A final word of thanks is due to members of the Curriculum Committee, the Publications Committee, and teachers who have submitted materials and made suggestions that strengthened this Bulletin.

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Chapter 1

Problems Approach—Theory[*]

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Although the problems approach is popular among teachers, it is not always achieved in practice even by its most fervent supporters. This discrepancy between intent and achievement exists primarily because a theory of problem-solving has not been adequately understood by classroom teachers. Classroom teachers, for example, have not always understood that problems belong to people. A problem is *felt* by someone. It belongs to someone. Many of the problems that are covered in a problems of democracy course are not felt as problems by most students. To feel a problem is to be aroused to the point where one wants to learn enough about it to do something about it. This feeling has two components, *doubt* and *concern*. Any attempt by a teacher to create a problem without arousing students emotionally can only result in a pseudo-problem. When students are disturbed, upset, perhaps even angry, they are closer to having a problem than is ever the case when teachers make preservation of objectivity their only concern.[**] A teacher can sometimes create in students a feeling that their beliefs, concepts, or values are inadequate in some respect. When students are puzzled over what to believe, they are more likely to have an authentic problem in their possession.

The difference between pseudo and authentic problems has been described in an article on the teaching of English by Elizabeth Berry.[1] Her comment is relevant to both social studies and English. In her article she describes the problem-solving activities of an English teacher who conducted a unit on *The Role of the Newspaper in the World Today*. This teacher began by announcing to her class that they were going to study a unit on newspapers. She spent most of the first day telling them why such a unit was important to study. On the second day, the class, under teacher leadership of a highly manipulative kind, developed a list of objectives. The list was essentially the same as one made by the teacher during her pre-planning session. In fact, the objectives did little more than paraphrase the arguments made by the teacher on the first day. Then the teacher announced some activities which if pursued would lead to achievement of the agreed upon objectives. In the following weeks the activities were taken up and completed on schedule and in a systematic fashion. For each activity the teacher supplied materials and prescriptions in profusion. She was well prepared—so well prepared that an objective observer might easily conclude that this teacher's approach assumed as a basic principle, the more profusion the less confusion.

The classroom activities were many and varied. Newspapers were read, news items discussed, letters written to editors, and articles prepared for the school newspaper. A local reporter spoke to the class, and proved so delightful that the class had no doubts as to the importance of the press. The letters written to editors were first graded, and then presumably mailed. Some time was even given to vocabulary drill in order that students might increase their understanding of news reports and editorials. The unreflective nature of the entire enterprise is best revealed by the fact that at no time did the teacher ask students to question the accuracy of a news report. She conveyed instead the impression that anything in print is probably so. In the evaluation that concluded the unit the students agreed that they "had learned how to read a newspaper," and "recognized the importance of reading, and expected to confirm their interest by making a daily reading of

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[*] Abridged and adapted from *Teaching High School Social Studies*, 2nd Edition, by Maurice P. Hunt and Lawrence E. Metcalf. Copyright © 1955 by Harper & Row, Publishers, Inc. Copyright © 1968 by Maurice P. Hunt and Lawrence E. Metcalf. Reprinted by permission of the publishers.

[**] Of course, any climate can become threatening.

the newspaper a part of their lives." In short, they agreed that their objectives had been achieved. The last act of the teacher was to announce that it "was time to move on to another unit, which would be a study of Macbeth."

Berry taught the same unit quite differently. Because she wanted her students to become critical readers as well as improve their language skills, she addressed the unit to the student belief that anything in print is likely to be true. She began by making available reprints of reports on the same subject from three different newspapers. The three articles were read and discussed on successive days. At the end of the third day the students were genuinely puzzled, and spent most of the fourth day wrangling over the truth. Some students were even angry because a liberal interpretation of the facts violated their conservative prejudices. Out of this rather heated discussion came a definition of a problem that had not been announced or imposed by the teacher. Next, the teacher planned with the group some activities that might enable them to answer the questions contained in their problem. The activities were the kind that made students active as researchers not only in the library but in the wider community. They studied not only newspapers but semantics and the press as a social institution. One student stumbled on the technique of comparing an original article with the condensed version in *Reader's Digest.* Many of their activities resembled those carried out by the first teacher, but the spirit in which they were performed was different because the students were puzzled and concerned over the question of what to believe in a newspaper, and how to determine what to believe. They were particularly concerned because it was obvious to everyone that their problem applied to all printed material, not just to newspapers, and even to much of what they had heard from teachers and parents. Unless a student has a problem in what to believe, he has no problem at all.

No one has captured in words the essence of a problem better than John Dewey when he wrote many years ago, "Unless there is something doubtful, the situation is read off at a glance; it is taken in on sight; i.e., there is merely perception, recognition, not judgment . . . But if it suggests, however vaguely, different meanings, rival possible interpretations, there is some *point at issue,* some *matter at stake*. Doubt takes the form . . . of controversy within the mind. Different sides compete for a conclusion in their favor . . . Every judgment proceeds from some such situation."[2]

In some classrooms teachers pass out a sheet of paper on which *The Farm Problem* is stated. This may not be a problem to any student or farmer or government official. Whether this becomes a problem for students will depend upon the teacher's skill in getting students doubtful over some matter of belief that concerns them deeply. Again, doubt alone is not enough. A student may be puzzled over the answers to crossword puzzles or double acrostics, but not be concerned enough to work out solutions. Teachers have never found it difficult to puzzle students. Much more difficult is to arouse student interest.

The problems approach solves this problem of concern by attempting to cast doubt on a belief held by a substantial number of students in a class. It is assumed that students will be concerned if they perceive good reasons for doubting what they have always believed. A student who begins to feel that something that has always made sense to him is actually *senseless* will have a problem in our sense of the word. Let us imagine a student who believes that a belief in the inferiority of Negroes functions for many people as a reason for racial segregation. He may also believe that this belief in Negro inferiority is more commonly held by Southerners than by Northerners. If he learns that Chicago is a more segregated city than Birmingham, he may wonder why. His beliefs simply do not account for this phenomenon. The discrepancy between his beliefs and actual data cries out for an explanation, and many students with this kind of conflict would be puzzled and concerned enough to want to learn more about it.

In many classrooms the only problem held by students is the problem of figuring out what responses a teacher will accept as correct. John Dewey has commented on the learning consequences of making this kind of problem dominant in a classroom:

"The operation of the teacher's own mental habit tends, unless carefully watched and guided, to make the child a student of the teacher's peculiarities rather than of the subjects that he is supposed to study. His chief concern is to accommodate himself to what the teacher expects of him, rather than to devote himself energetically to the problems of subject matter. 'Is this right?' comes to mean 'Will this answer or this process satisfy the teacher?' instead of meaning 'Does it satisfy the inherent conditions of the problem?' It would be folly to deny the legitimacy or the value of the study of human nature that children carry on in school, but it is equally undesirable that their chief intellectual problem should be to produce the answer approved by the teacher, and that their standard of success should be successful adaptation to the requirements of another person."[3]

Dewey is now talking about the *logic* of problem-solving. When we press for the importance of doubt and concern as signs that a problem has been felt by someone, we are talking about the psychology of problem-solving. Many of Dewey's interpreters have overlooked his concern with logic. An answer has to be grounded before it can be taken as learned. It is logic, not teacher approval, that determines the rightness of a student's response. Because Dewey frowned upon teacher approval as a criterion for "right answers" it does not follow that teachers should not require students to be right. A reflective classroom does favor right answers over wrong. Knowledgeable teachers can function more effectively than ignorant ones. Certainly, a teacher of thinking will not accept every answer as right. Neither will he dismiss a wrong answer peremptorily, and thus fail to capitalize on its learning value. It is a teacher's treatment of an answer, whether it be right or wrong, that determines whether a student solves a problem reflectively. Hullfish and Smith have made the claim that a wrong answer can be as educative as a right one. The following anecdote may communicate what they had in mind:

"A student, for example, once offered the suggestion that 'vapor condenses when the temperature rises.' The answer was given honestly, and the teacher, instead of saying, 'No, that is wrong, you tell us, George' (and George and several others were waving hands to indicate they knew the answer to be wrong), initiated a line of questioning to compel the student to 'do battle' for his answer. The teacher pointed out that when a person wearing eyeglasses steps into a warm room on cold days the glasses steam over. He then asked if the suggestion accounted for this fact. The student proceeded to show that the air within the room was warm and that, therefore, a rise in temperature was the cause. When questioned about the sweat on an ice pitcher in the summer, the hoarfrost on a man's mustache in the winter, the dampness of refrigerator pipes in warm weather, the steam on window panes in the winter, and the regular phenomenon of frost, the student demonstrated, to his own satisfaction in each case, that a rise in temperature was the cause. Warm air surrounded the pitcher; the man's breath was warmer than the air he breathed; warm air completely surrounded the refrigerator pipes; the air within the room was warm, and, hence, that air closest to the windowpanes condensed; the warmth of the earth caused the regular coating of frost on nights when cold air hovered over the ground.

"The student was eagerly matching wits with the teacher; and, as the process continued, the rest of the class visibly took sides, although not overtly participating. The teacher, it is clear, kept bringing varying facts to bear on the suggestion, knowing that in each instance the student would weave his web stronger by explaining them in the light of his hypothesis. Obviously, it was up to the teacher (or to the class, had he turned to them) to furnish a crucial case, a specific instance, in which the hypothesis would not stand up. Unless this could be done, the student must be conceded to have a plausible answer to the problem of condensation. Finally, therefore, the teacher described the case of steam escaping from a boiling kettle, and, as before, the student continued with his hypothesis, though with less assurance. When the teacher started to ask why clouds were overhead if his were the right explanation, the student suddenly shouted, 'Vapor condenses when there is a lowering of temperature.' He then quickly reviewed, under the direction of the teacher, all of the incidents he had misinterpreted to show that in each case the cause had been a lowering of temperature."[4]

In the above example, a student stated a belief. The teacher tried for doubt by testing the belief against a number of cases. Only when a case could not be explained by the student's belief did he see any reason to doubt it. A new belief occurred to him almost at the same time that he had come to doubt his first belief. Advocates of inductive teaching might argue that the teacher was too active, but no one could argue that a problem had not been solved reflectively.

Clearly, a teacher who favors thinking will also favor the "right answers" to which thinking leads. But a teacher who combines an interest in "right answers" with a concern for thinking will need to settle in his own mind what constitutes a desirable relationship between his knowledge and student belief. This relationship, presumably, should not do violence to what we know about thinking, and the conditions that give rise to it.

There are actually three variables in the problem we have just outlined—knowledge, teacher belief, and student belief. Teachers, like students, may believe much that is not so. And students, like teachers, may believe much that is so. Whenever there is a clash between teacher belief and student belief, an objective observer will want to know whose knowledge is pitted against whose ignorance. He may even entertain the hypothesis that both student and teacher are ignorant in a given situation. This is to say that a teacher who believes in and practices a problems approach will be willing to practice that approach on his own beliefs. A teacher who expects students to doubt their beliefs will find it necessary to doubt his own beliefs. If he is not willing to do this, his students will consider him hopelessly dogmatic.

Sometimes a teacher will apply one approach to beliefs with which he disagrees, and use a quite different approach with the student who agrees with him.

The following description of a teacher in action illustrates what can happen:

". . . . The writer vividly recalls observing a teacher who avowed as her sole aim the development of independent thinking among her pupils. The class had embarked upon the discussion of such current events as happened to be treated in the weekly paper to which they subscribed for this purpose. The lead story was on the then-current coal strike. A boy in class delivered himself of the idea, 'If miners would be sensible with their money, instead of throwing it all away on whiskey, they'd find that their wages were more than they need.'

"The teacher moved in fast. Under a barrage of well-placed questions, the lad admitted that (1) he had no idea how much a miner was paid; (2) he had no firsthand knowledge of the personal habits of miners; (3) his sole source for the view he had announced was a muttered reaction of his father's at the breakfast table; (4) he doubted that his father had any actual information on either of the relevant points; (5) he recognized that one ought not to make such a drastic or sweeping generalization unless he had facts to back it up. So far, so good.

"The next reaction came from a girl who remarked with deep feeling that whenever men strike they lose money, and that this fact so disturbs wives as to upset their home life very seriously. 'So', she concluded, 'I think that whenever men strike they must be in the right, or they wouldn't do a thing that's going to be so unpleasant for them.' The writer's eyes were on the teacher as he waited for this avowed foe of the facile generalization to swing into action. All that the teacher did, however, was to beam and announce solemnly, 'Helen, that's what I call a very nice insight.' "[5]

A teacher needs a criterion other than his disagreement with a student's statement by which to decide whether to question it closely. In the classroom that has just been described the boy whose belief underwent attack learned a great deal. Helen, on the other hand, had her belief confirmed because she happened to agree with her teacher's prejudices. She learned nothing at all. If a teacher has a criterion by which to determine the rightness of an answer, and a criterion that does not depend merely upon teacher approval, there is some chance that his students will engage in thinking. In general, a teacher should ask that terms be defined, assumptions stated, and evidence presented regardless of how sound he believes a student response to be.

Perhaps enough has been said about the nature of problems and problem-solving. Let us turn next to a justification of a problems approach. Why study problems? An answer to this question will throw additional light on the reason why teacher approval ought never be the only basis for determining whether a student response is correct. From Dewey we derive the idea that prejudice as ungrounded belief can be most effectively eliminated by a problems approach in our teaching.

One of the meanings people have for the expression, think, is sheer believing. When a person says, "I think it is going to rain," he means that he "believes" precipitation is about to descend upon him. The trouble with this use of the word, think, is that it confuses product with process. Thinking leads to belief, but many of our beliefs have not been acquired or tested in this way. Many of our beliefs have been picked up simply because they happen to be around the house. We accept them because they happen to be current, not because we have examined them carefully and chosen them from alternatives. We can all appreciate that very young children simply could not acquire their beliefs in this latter way, and many, many of our adult beliefs are acquired early in life when innocence rather than maturity and reflection was our defining attribute. Young minds seldom take an active part in reaching and framing beliefs.

Such beliefs as we acquire unreflectively are called prejudices. We have no ground to offer when asked to defend them. To say that they are ungrounded is not to say that they are false, or even that they place certain objects, events, or persons in an unfavorable light. We may like certain persons or things without having any basis for justifying our feelings or preferences.

Two men may hold that there are no inferior races. One of the men can produce no evidence to back up his truth claim. Perhaps he comes from a "liberal" family in which this belief prevails. His belief, although true, is for him ungrounded. The other man may have grown up in a family in which there was a strong belief in white supremacy. But he has in his later years "looked into the matter" and on the basis of evidence has rejected this element in his early training. When asked to do so, he can define the key terms in his belief in equality, can state his assumptions, declare his values, and marshal his evidence. His belief, although the same as the other man's, is different. He possesses his belief; he is not possessed by it.

It is clear, then, that a problems approach is intended to reduce prejudice. Teachers who use this approach will frequently question a belief very closely, particularly if it is one generally prevalent in our society, on the ground that the students who hold it may not be able to prove or defend it. Correctness of belief in students is often a matter of accident, and reflective teachers want to be sure that students understand and know what they are talking about. The classroom in which students learn no more than how to say what the teacher wants them to say is a poor classroom indeed. Teachers who are concerned only with correctness of belief can purvey as much prejudice as they seek to destroy. Of course, students who examine their beliefs carefully will reach many correct conclusions, but in addition they will have a ground with which to support what they believe. It is in this sense that a problems approach is intended to produce understanding rather than rote learning.

Another claim made for the problems approach is that the practice of problem-solving improves one's proficiency in the solution of problems. This is a dubious claim. Central to the learning theory behind a problems approach is the belief that practice or repetition does not improve one's insights or performance. For this reason a problems approach is usually viewed as an alternative to drill or recitation. The use of a problems approach could be expected to improve problem-solving only if the problem-solving activities of a group became a subject of critical study. In order to do this a group has to occasionally look at what it is doing, and begin to think about its thinking.

One way that a group can test its thinking is to apply the rules of logic and scientific method, and reach conclusions as to the soundness of its reasoning. To practice some thinking and then to examine critically one's practice seems to be a more effective approach to the teaching of thinking than the usual courses in logic or philosophy of science. One uses knowledge from these fields as a basis for assessment of one's thinking.

When a problems approach is used beliefs are accepted or rejected according to rules such as the following:

1. Whenever one belief or conclusion is preferred to another, it is because the evidence no matter how slight is in its favor.
2. Conclusions are provisional. All knowledge is relative, and what we believe today may turn out tomorrow to be false. Problem solvers operate according to the principle of continuous control—all the evidence is never in. If there are eternal truths, men will never know whether they know any.
3. Conclusions have to be consistent with one another. Beliefs that contradict one another cannot be true. Something has to give.
4. Although all the evidence can never be in, we rest our conclusions on all the pertinent evidence known to us. We do not slant or ignore any of the pertinent evidence known to us. If someone else offers pertinent evidence not known to us, we welcome it with open arms.
5. All operations must be performed openly and in a fashion which will make it possible for others to repeat our procedures. As one man put it, we test beliefs in the public square with no secrets as to what is taking place.
6. The authority for a conclusion is in perceivable phenomena. Mystic claims are taken as hypotheses and tested if possible in the same way as other hypotheses. If they cannot be tested in that way, they remain what they are—hypotheses and nothing more.

A teacher who understands these rules or criteria can communicate them to students as a better basis than teacher authority for determining the adequacy of a belief or response made by students. They can use these rules as they assess their thinking. If they do not want to accept such criteria simply because their teacher recommends them, they can make comparisons with alternative conceptions of truth, and in doing so the adequacy of scientific method becomes an object of student inquiry. Whether science can answer all our questions, or whether any method of inquiry can answer questions science cannot answer becomes the heart of such inquiry. It is here that revelation, intuition, extra-sensory perception, and even simple religious faith become issues. If we are unwilling to have students examine this problem, we become guilty of a dogmatic commitment to a certain conception of problem-solving. The claims made for a problems approach assume science and its method as a model to be followed in our pedagogy. But it would be a violation of the model not to question its assumptions.

We have said that every problem is a problem in what to believe. Problems are however several in kind, depending upon what kind of belief is to be tested. Without oversimplification we can think of three kinds of belief—concepts, generalizations, and values. Each requires a somewhat different kind of verification.

Concepts are different from generalizations, although they may be confused with generalizations in much of the literature on psychology of learning. Expressions such as "people migrate when they are hungry," or "generals are babes in politics," or "bad money drives out good," are sometimes called concepts but they are actually generalizations. We test these generalizations by looking at the pertinent evidence to see whether they are true. Much of our discussion so far about testing beliefs has had in mind generalizations of the above sort. Again, the student has no reason to look for evidence unless he has reasons to doubt the truth of a generalization.

Concepts are the terms in a generalization. If we think of a generalization as a lawlike statement, terms within them such as "good money," "generals," "babes," and "politics" become identifiable as concepts. Generalizations express a relationship among concepts. For example, the statement that deficit-financing contributes to inflation under conditions of full employment expresses a lawlike relationship among the concepts, deficit-financing, inflation, and full employment.

Students will not understand a generalization if they do not understand the concepts within it. An attempt to understand a generalization must precede any attempt to test its truth. Our distinction between a concept and a generalization suggests that the former is primarily a definition. Definitions are never true or false, in any empirical sense. When we test generalizations, we check it against the evidence. We also use evidence when we examine concepts, but we use it somewhat differently. Suppose we want to develop the concept of civil war in a history class. How would we proceed? We would probably want to start with a definition that distinguished civil war from other kinds of war. We would, in other words, set forth as clearly as we could the characteristics or properties a war must possess in order to be classified as a civil war.

We would then look at a list of wars, and pick out the ones that were civil wars according to our definition. Certain facts about each war would enable us to determine which wars were civil wars. Our definition of civil war is not factual in nature, although it is a fact that we have defined civil war in a certain way. And it is also a fact that certain wars can be properly classified as civil wars, provided that no one questions our definition or our facts. It is surprising to know that most teachers and students do not distinguish between facts and definitions. Yet this distinction must be drawn if teachers are to use a problems approach to teaching concepts.

The difference between thinking about a concept and thinking about a generalization has great effect on classroom procedure. Suppose that a teacher defines as a bachelor any unmarried male who is over thirty years old. Let us suppose that a student questions the "truth" of this definition. He might argue that one could be older than thirty and not be a bachelor even though unmarried. Or he might argue that any male who is unmarried would be a bachelor regardless of age. The teacher could not settle this dispute by making a community survey to find out whether any of the bachelors were younger or older than thirty. He could not find any bachelors at all without first defining a bachelor, and his definition would indicate whether age was a factor in the meaning of bachelorhood.

The claim that married men live longer on the average than bachelors, if questioned, *could* be settled by a survey. This survey could be made if we could agree on the traits by which to distinguish bachelors from married men. We would simply look at the facts on longevity for the two groups, and draw our conclusions. Our only serious problem would be to make certain that our sample was representative of the population for which we wished to make a generalization. The procedure, then, for testing a generalization is fairly clear. But how do we test a definition if it is true to say that definitions are neither true nor false?

If the purposes of a teacher are reflective, and what other kind of purpose would a teacher hold under a problems approach, he would ask the kinds of questions that would help to make a definition as clear and precise as possible. One test of any definition is to ask whether it is as clear as it might be. Another test is to ask whether it is too broad. A definition that covers everything is no definition at all. A reflective teacher would also want his students to make comparative studies of different meanings for the same term, noting similarities as well as differences.

It is important, too, to look for consistency in a definition. In some regions of the United States a Negro is defined as a person who has even a small degree of Negro ancestry. It would be reflective, then, for a teacher to ask, "If a person is a Negro if he has any Negro ancestry at all, why don't we define a person as white if he has any degree of white ancestry? Are Negro genes more powerful than white genes?". Of course, it is a fact that in certain parts of the United States a person can be called a Negro even though most of his ancestors are white. This fact does not tell us how a Negro *should* be defined.

It contributes greatly to the clarity of a definition to distinguish between its *extensional* and *intensional* meanings. When we are able to state the attributes of a category, we are stating its intensional meaning. When we can do no better than to give examples, we limit ourselves to extensional meaning. The Beardsleys have expressed the difference this way: ". . . .The extension of a word is the set of things to which it is applied, according to a rule; the intension is the set of characteristics that things must have in order for the word to apply correctly to them. The extension of 'city' is London, Paris, New York, Berlin, Tokyo, Moscow, Nairobi, etc. The intension of 'city' is (roughly) the characteristic of being a politically independent area of high population density and large population total."[6]

If students cannot agree on whether a certain community is a city, they can resolve their differences only if someone can state an intensional meaning of city which is acceptable to everyone. The class has to reach some agreement on the characteristics of cities. Then it has to decide whether the community in question has those characteristics. The reflective task is to settle upon a meaning for city, and to decide whether the community in question is properly designated a city or not. In order to do this, what facts are needed? Is it a fact that we customarily label a community a city only if it has certain characteristics? What are the characteristics we customarily reserve for cities? And is it a fact that community *X* has those characteristics?

In a culture with language and other symbolization as advanced as ours, a person is at a serious disadvantage if he cannot express the intensional meanings of concepts. More importantly, theory building is seriously handicapped when intensional meanings are unclear. It is apparent that we cannot settle for a scholarship that can merely cite examples. On the other hand, we may suspect that the student who can give a verbal definition of a concept, but cannot supply examples is lacking in understanding of the concept. Ideally, we want students to be able to define a concept intensionally, and then be able to illustrate it with concrete examples, indicating for each example why it qualifies as an instance of the concept.

Should a class always agree on the intensional meaning of a concept? The answer is, "Yes, whenever possible." Bruner in his study of thinking has distinguished between personal and official definitions.[7] Official definitions are those established by law, scholarship, religion, or some other authoritative group. If we want to know what is meant by disease we turn to the medical profession for an answer. We would not pay serious attention to any personal definition that differed from a medical definition unless the person could show that his definition was superior in certain respects. The superiority of official definitions does not mean that a teacher should have no interest in students' personal definitions, or to dismiss their definitions without consideration. To ask for personal definitions is a practice that helps a teacher acquaint himself with the backgrounds of students. But this background has to be treated reflectively if students are to learn anything from airing their opinions.

Whether we prefer an official meaning made available to us by a scientific authority may depend almost entirely on whether we share with that authority certain values. Any scientific authority values the capacity to explain and predict. This is what scientific work is all about. Some authorities have referred to explanation and prediction as the unqualified goals of any science. Definitions or concepts usually reflect classification systems. There is a preference among scientists for any classification system that makes it possible to deduce a great deal from a little. Why do biologists, for example, want students to learn a classification system under which whales and porpoises are perceived as mammals, and not as fish? Is this preference merely a quirk of scholarship intended to irritate laggard students? Kuhn suggests a different reason:

> After various classification systems are tried, that one is considered best which contains the largest amount of information for the purpose of the scientists. It is the most efficient system for handling the kinds of information the scientists want, or more precisely, the system which permits the largest amounts of information to be deduced from a given amount of information. For example, the biologist is distressed if someone refers to whales and porpoises as fish, insisting adamantly that they are mammals, not fish. We will accept his assertion that they *are* mammals under his system of classification, and go beyond to inquire why biologists prefer a classification system that thus categorizes them. They could, after all, put all water-dwelling animals in one group and all land-dwelling animals in another, with appropriate but non-overlapping subdivisions of each. In such a system the whales and porpoise could never fall into the same category with any land animals, as they now do.
>
> We will now try to see why a system which classifies whales and porpoises as mammals, which are overwhelmingly land animals, provides more information than a system which classifies them as water animals. Under the existing system, if we possess a specimen of a thing called a fish, we know without looking further that we will find a particular kind of circulatory, nervous, excretory, and other systems, and that we will find gills for the breathing of water. Suppose instead that the term "fish" were broadened to include whales and porpoises, because they look like fish and live in the water. Then even if we knew that we had a fish in front of us, this fact would not tell us whether the specimen has lungs or gills, or what kind of other internal systems it would show. Another well known conspicuous example is the classification of bats as mammals instead of birds.[8]

Children mistakenly believe that the names of things mirror the nature of things. Vigotsky in asking children whether we could switch names so that a cow would be called ink, and ink cow, received as a reply, "No, because ink is to write with, and cows give milk."[9] Even high school students can confuse names with nature. Such views make no distinction between words and their referents. They reflect what I. A. Richards once called *The Proper Meaning Superstition,* the idea that there is a single correct meaning for each word in our language.

We can summarize our discussion of concepts by saying that they can be exposed to reflective tests, but that we do not test them in the same way we test generalizations. We say that a student understands a concept when he can state its intensional meaning. He demonstrates additional understanding when he can give examples. He understands a generalization when he can define its key terms, and support it with evidence. The logical difference between defining a concept, and supporting a generalization with evidence must be understood by any teacher who is to make wise use of a problems approach.

We are ready to turn to a third kind of problem. Value problems pose some difficulties somewhat different from those associated with descriptive concepts and generalizations. We labor under a tradition that says moral problems cannot be solved scientifically. Whether or not this is completely so, it is possible for people to think about such problems and come to conclusions that are somewhat better than ones available from habit, luck or impulse.

We noted earlier that thought arises from a felt problem. To feel a problem is to be doubtful and concerned. We doubt a concept when we are not sure of its meaning. We doubt a generalization when we are not sure of its truth. When do we doubt a value? We seem to be most likely to doubt a value when it is in conflict with another value. Value problems consist of values in conflict. These value conflicts are between good and good, not between good and evil. When two desired courses of action come into conflict, moral choice is necessary.

That typical moral problems of youth involve choices among competing goods is supported by the Havighurst and Taba study of beliefs and behavior among sixteen-year-old boys and girls.[10] They reported that the adolescent peer culture placed great value on social participation, group loyalty, and individual achievement and responsibility. The group studied also accepted the traditional middle-class values of a midwestern community—respectability, thrift, responsibility, self-reliance, and good manners. Adults could hardly find fault with the predominant values of youth culture in this community. High school students seemed committed to the ends most revered in our society.

But the study also revealed clearly the kinds of conflicts in which persons in our culture become embroiled. One of the cherished values of the sixteen-year-olds was loyalty to one's friends, a value that most adults would approve. But loyalty to the group seemed to require following the pattern of behavior generally practiced in the group, minding one's business about what others did, avoiding criticism of one's friends, and refusing to condone criticism on the part of others. In many cases, members of the peer group were violating one or more of the traditional moral standards, but other members felt obligated to protect them in this behavior, at least to look the other way. They were thus caught in a conflict between two loyalties—one to the peer culture and one to the adults of the community who were trying to enforce the conventional mores.

Although the Havighurst-Taba study is now many years old, times have not changed. In 1966 *Newsweek* reported the results of a poll taken by Louis Harris and Associates, Inc. Interviews with a representative cross-sectional sample of 13-17 year-olds revealed that 96 per cent believed in God. But such practices as copying one another's homework, plagiarizing from critical essays, carrying crib notes to class, and stealing examination questions from faculty offices were the fashion, according to teachers' and administrators' reports, and by the students' own admission.[11] Allen Barton who studied students in 99 colleges concluded that half his sample cheated, and that cheating would be more prevalent in high school.[12]

Another study, dealing with college students, found that most of them disapproved of cheating, but that it was all right to cheat if everyone else was. The tendency to practice cheating if others were doing it was strongest among religious students. Irreligious students were least likely to succumb to the pitfalls of conformity. The same study revealed that religious students had stronger racial prejudices.[13]

Jacob in his study of college students and their values reported that 66 per cent would not report a cheater if he were a personal friend, but only 16 per cent would fail to do so if he were not a friend. The same students would undercut friendship in favor of honesty if there was evidence that college authorities knew about the cheating incident. In such circumstances only 27 per cent (compared with 66 per cent in other circumstances) would fail to report a friend. Students would squeal on their best friend if it helped to keep them out of trouble.[14]

The traditionalist in morality is likely to say that cheating is bad, and not cheating is good. One has to decide whether to be good or bad. Most studies suggest a different perspective. Passing courses and not cheating are good. When it appears that one cannot pass a course by not cheating, some students will choose to cheat. Parents have been known to support this kind of choice.

Most schools try to solve this problem by a policy of heavy handed moralizing, all of which assumes that value conflicts are between good and evil. They go about this in various ways. One common practice is the teaching of precepts. "Honesty is the best policy" or "A stitch in time saves nine" may be taught as sacrosanct moral principles. Stories that make moral points flourish throughout the curriculum. Some of the stories are legendary or apocryphal in nature with protagonists who exemplify a purity that no teacher or parent could ever possess.

Another practice of the moralizers is example-setting. The teaching of precepts is sometimes regarded as ineffective because entirely verbal. Pupils, it is believed, learn from examples more readily than from precepts or stories. Teachers are expected to behave before pupils in exemplary fashion. The crude language that pupils hear at home is out of place in the classroom. Until the arrival of World War II married women were not permitted to teach in most public schools on the assumption perhaps that virgins could set better examples.

Another device practiced by moralists at all levels of public education is patriotic and religious ritual, the latter in clear violation of the First Amendment. Singing the national anthem and pledging allegiance to the flag are opening exercises at many a school function. Whether it is moral to be patriotic, or whether democratic patriotism is different from other kinds of patriotism, or whether one can be loyal to both God and Country in all circumstances, as the Eisenhower version of allegiance to the flag seems to imply, are questions seldom raised by those who see moralism as a solution to the problem of character education.

The most sophisticated form of moralism is environmentalism. This form is particularly popular with moralists who pride themselves on being "modern" or "progressive." It is their belief that "values are caught, not taught." Students learn democratic values from a classroom that is democratic. Parents act on a similar principle when they surround their children with "good" books, music, and art. In this way children are said to develop good taste.

All these attempts to teach children to distinguish between right and wrong—teaching precepts, setting examples, telling stories, ritualizing, and environmentalizing—share in a tendency to preach and exhort. The entire enterprise is usually supported by a system of rewards and punishments. The child's only problem is to figure out what is expected of him, and to behave accordingly. Because values can conflict he is sometimes punished for doing what he thought was expected of him.

If preaching and exhortation, rewards and punishments, all are present, analysis is absent. Students who have not learned to behave democratically from living and learning in a democratic environment may not be able to cope with criticisms of democracy. When democracy conflicts with some other value, they are not able to choose.

Such students may have as democratic behavior no more than the habit of saying the right things. They verbally endorse the American Creed of equality and liberty, but very few would welcome Negroes as next door neighbors or marital partners. The idea that people can be democratic without thinking about their choices seems a questionable assumption.

When students begin to think about values, they will have to think about concepts, generalizations, criteria, evidence, and meaning. Suppose that a teacher wants his class to understand and evaluate a policy of collective bargaining. First of all, he will want to make sure that they understand collective bargaining as a concept. He will proceed upon the simple assumption that sound evaluation of any policy depends in part upon sound knowledge. We would pay very little attention to a person who supported or opposed collective bargaining, but who at the same time confessed he knew very little about it.

The teacher who seeks to develop in students the concept of collective bargaining will ask for examples of it (hence, dealing with extensional meaning) and he will also ask for its defining criteria (intensional meaning). At this stage of concept analysis he may ask students to compare and contrast collective bargaining with individual bargaining. "How does a worker bargain with an employer if he is not a member of a union?", the teacher may ask. He may also ask for relationships between collective bargaining, closed shops, strikes, picketing, and right-to-work laws. It is doubtful that collective bargaining as a concept can be understood except as it is studied in relationship to these other concepts.

Once a class achieves some clarity as to the intensional meaning of collective bargaining, an understanding which includes its relationship to other concepts, it is ready to consider another kind of knowledge, that having to do with consequences. Some attention to consequences has no doubt been present during the concentration on concept analysis, but now the attention is to be more central and deliberate. To ask students to project the consequences of collective bargaining is to ask them to turn to history, and economic theory. What have been our experiences with collective bargaining, and what does economic theory say about the effects of collective bargaining on wages?

There will be a tendency for students who dislike collective bargaining to predict dire consequences, and for students who like it to predict more roseate results. Both kinds of students may be victims of "tunnel vision," predicting only a few of the consequences. The teacher has to prod them into predicting many, many consequences as most policies have many results. If students disagree over consequences, the teacher will ask them to gather evidence with which to test their statements about consequences. This kind of evidence is not always easy to obtain, and students are likely to assume that any statement about consequences is mostly a matter of conjecture or speculation. A thorough study of history and social science theories organized around policy questions is likely to increase their confidence in playing the game of truth and consequences.

When the class has achieved some agreement on the consequences of collective bargaining, it is ready to evaluate those consequences. Are the consequences desirable or not? One decides this question by turning to criteria that are derived from the moral philosophy to which one subscribes. One consequence of collective bargaining is that workers may have a more effective voice in certain decisions that affect them. Those who subscribe to democracy as a basic philosophy will then tend to evaluate collective bargaining in favorable terms. Those who favor a free market more than they favor democracy are likely to make an entirely different evaluation. What evaluation is made should be consistent with one's other evaluations. This is not always the case, and a teacher can always stimulate some thinking in students by bringing inconsistencies to their attention.

An example of inconsistency is the student who wants workers to operate in a free market with wages determined by the law of supply and demand, but who favors protective tariffs and fair trade laws as means by which to make prices immune to competitive regulation. One result of such inconsistency can be low wages, high prices, and huge profits, at least in the short run.

If we were to outline what has been said so far about values, a teaching model might include the following elements and questions:

A. Nature of object, event, or policy to be evaluated—the problem of concept analysis.

1. How is the object to be defined, by what criteria? What do we mean by socialized medicine, welfare state, collective bargaining, and so on?
2. If people disagree over criteria, if they can't agree, for example, on a meaning for freedom, what can be done? How are those differences to be treated? Are the differences traceable to differences in philosophy or theory? Do they have to agree? Is it enough for everyone to be clear, and the heck with consensus?

B. The consequences question.

1. If we are trying to evaluate a policy, does it help to know consequences?
2. If there is disagreement over consequences, how can this be reduced?

C. Appraisal of consequences.

1. Are the consequences desirable or not?
2. By what criteria do we appraise consequences?

D. Justification of criteria.

1. Can the criteria used for appraising consequences be justified? How?
2. If people cannot agree on criteria to be used for appraisal purposes, how is this difference to be treated?

It should be clear from this model that teachers who use the problems approach in the realm of values can use knowledge, and communicate it to students. There is an official definition of collective bargaining that every student should be expected to learn. There is, too, knowledge of the consequences of collective bargaining, and teachers can objectively communicate this knowledge. Finally, every student should learn that consequences can be evaluated only if one has criteria by which to operate. Not every student need use the same criteria, and students can vary widely in their appraisal of consequences. A teacher has no right to insist that students use as criteria only those that the teacher approves and holds. To do this would open the door wide to indoctrination, and undermine the problems approach as we have defined it. A teacher can insist, as would any other scholar, that students use criteria consistently, and relate their criteria back to a philosophy to which they subscribe. Obviously, students need not all subscribe to the same philosophy.

This concludes our discussion of the problems approach. It has a general meaning that has to be adapted as it is applied to different kinds of content. The three kinds of content are concepts, generalizations, and values. Each kind of content poses its peculiar problems. What we can do with values depends in part on what we can do with concepts and generalizations.

For a long time in education there has been a conflict between those who would teach content and those who would teach problem-solving. This conflict seems to have been ameliorated to the extent that people are now thinking about problems in logical terms, making distinctions between content that is analytic and content that is synthetic, or contingent in nature. This new development should not, however, lead us to neglect the psychological aspects of problems. Without people there are no problems.

FOOTNOTES

[1] Berry, Elizabeth. "The Unit Process," *The Educational Forum*, March, 1963.

[2] Dewey, John. *How We Think*. Lexington, Mass.: D. C. Heath and Co., 1966, p. 121.

[3] *Ibid.*, p. 61.

[4] Hullfish, H. Gordon and Smith, Philip G. *Reflective Thinking: The Method of Education*. New York: Dodd Mead & Co., 1965, pp. 198-199.

[5] Griffin, Alan F. "The Teacher as Citizen," *Educational Leadership*, October, 1952, p. 7.

[6] Beardsley, Monroe, C. and Elizabeth Lane. *Philosophical Thinking*. New York: Harcourt, Brace, and World, 1966, p. 24.

[7] Bruner, Jerome S., *et al., A Study of Thinking*. New York: John Wiley and Sons, 1956.

[8] Kuhn, Alfred. *The Study of Society: A Unified Approach*. Homewood, Ill.: Richard Irwin, Inc., and The Dorsey Press, Inc., 1963, pp. 32-33.

[9] L. S. Vigotsky. "Thought and Speech," *Psychiatry*, 1939, #2, p. 36, quoted by Kuhn, *ibid.*, p. 33.

[10] Havighurst, Robert J. and Taba, Hilda. *Adolescent Character and Personality*. New York: John Wiley and Sons, 1949.

[11] *Newsweek*, March 21, 1966, p. 59.

[12] *Ibid.*, p. 60.

[13] Goldsen, Rose K.; Rosenberg, Morris; Williams, Robin, Jr.; and Suchman, Edward. *What College Students Think*. New York: D. Van Nostrand, 1960.

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Chapter 2

Problems-Resolution in the Elementary School

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Increasingly, in our time, our ways of life are changing so rapidly that creative responses to novel situations become a necessity of normal behavior. All humans face new situations, demanding analysis for choices and action. These are situations in which past experiences often are useful, but in which habituated responses may at times interfere with the new, inventive behaviors these situations require. In such situations past experiences may help us think through the problem, muster some ways to resolve it, and anticipate some of the consequences of various proposals for action. However, it is the new element in the situation which makes it a problem. If we keep trying "old" solutions and habituated response in situations that demand creative, inventive new thinking, we are unlikely to produce problem solutions or to discover productive new alternatives for action.

Elementary school children need, of course, to develop the habituated behaviors that give them the security of living within some structure. But children, growing into today's world, also need practice in recognizing situations where habituated behaviors are inappropriate, and where the need is for creative thinking along avenues not tried before.

The elementary school teacher faces, therefore, the dual task of creating an environment in which children (a) learn to live within a set of routines and develop those habituated responses that help them to meet regular, repetitive life situations with a minimum of effort; and, (b) at the same time, develop the attitudes and skills that enable them to attack problem situations confidently and intelligently.

Learning these behaviors requires more than a set of classroom procedures. It requires a point of view about problem solving, a view that conceives of problem solving as intelligent, productive behavior. It involves a point of view about teaching and learning—that learning is a "search," facilitated by teachers. And, it involves processes—skills for carrying on productive inquiry in situations where answers are not all laid out in advance, but where children, too, are engaged in the search.

The problems approach has been described as a procedure that ". . . seeks primarily to bring about changes in behavior—changes in ways of thinking, organizing content learned, reaching decisions, and participating in social action. . . ."[1] These objectives are not achieved simply through a set of classroom routines. They require understanding of how children grow into problem-solving personalities; how they develop tolerance for the search, and develop, over time, skills for independent, autonomous learning.

Developmental Experiences and Problem-Solving Enterprises

The elementary school years are a critical period in the long-term development of these learnings. These are the years when the child shapes his social self, develops attitudes toward learning, and establishes basic skills. It is within this learning matrix that problem-solving behaviors can be established, to be further extended in the secondary school years.

The young child comes to school eager, experimental, an explorer; or, he comes fearful, shy, uncertain of himself. He moves from the shelter of a home environment to the larger arena of the school. The primary grades are a crucial transition point in the life of a child.

If the primary teacher is mainly focused upon habituating the young child to school routine—to sitting quietly on the rug, to responding quickly to signals, to speaking only under certain stringent regulations—she creates a climate that cuts off these open exploratory behaviors basic to the problem-solving process. If, however, she sets the conditions which support intellectual growth, exploration, and experimentation, within a climate where each child finds support and security for taking steps as he is ready for them, then she has created the climate for children's growth as productive, problem-solving personalities.

The child who is secure, who sees himself as a worthy person, who experiences success in his initial efforts in this new world of school, is the one who reaches out for new experiences. Such a child can tolerate the trial and error search for solutions to novel situations, and can "afford" to make mistakes.

These attitudes about self are important. These are critical years for the young child, years when he has a number of developmental tasks to meet. He must relate himself to a mother surrogate, the teacher, who must be shared with twenty-five or thirty other children. He must gradually learn the give-and-take of group life, learning to relate himself to increasingly larger groups of children. He must develop the language skills that enable him to live in groups and communicate with others.

In these interactions he builds a picture of himself, of who he is, of how adequate he is. If he is helped to meet each of these tasks successfully, he builds a concept of self that enables him to reach out confidently to new experiences, to tolerate the frustrations of blocked or ambiguous situations and tackle new learnings willingly.

In the intermediate grades, he is again faced with new developmental tasks. Having learned to get along with teachers, he now has to learn to relinquish dependence upon these adults and shift his loyalties to his age-mates. He is busy winning his way into peer groups. He is now absorbed with acquiring social status and skills and the physical prowess so valued by the child culture. In addition, his intellectual world is opening up and he is absorbed with new knowledge and the acquisition and refinements of skills needed to negotiate that knowledge.

All these developmental tasks are imbedded in emotions. The way each is met depends on the kinds of feelings that the child brings to each situation. And, again, his feelings are a product of the ways in which he has been able to meet each past challenge—with adequacy, or with a deep sense of failure. Lawrence Frank[2] points out that if each of these new tasks is met well, the child maintains his wholeness, is able to move on to new challenges; but if he is not able to do this, he remains with "unfinished business" that absorbs his energies and leaves him unfree for next steps in his development.

The child with an inadequate self-concept becomes defensive. Preoccupied with protecting himself against a threatening world, he is not free to explore new challenges nor is he open to problem-solving situations. Even though we teach him all the "steps" in problem-solving, he may not be emotionally free to enter into the process intelligently. He is too busy either with the "unfinished business" of his previous situations or with protecting himself against more failures in new situations.

A child tied up in knots because of unresolved emotional problems, such as conflict with parents or siblings or inability to get along with his age-mates, is in no state to identify with people about whom he is studying in his social studies program. He is too busy trying to live with and resolve his own immediate personal difficulties. We cannot expect him to identify with a child of Mexico, or an oil well driller and his job if he has not yet learned to identify with those immediately around him.

Children who are whole, complete, integrated, have the resources to meet the pressures and stresses of society and deal with them more effectively. As Maslow reminds us, self-actualizing persons are in general ". . . strongly focused on problems outside themselves . . . they are problem-centered rather than ego-centered. They generally are not problems for themselves and are not much concerned about themselves; i.e., as contrasted with the ordinary introspectiveness that one finds in insecure people. . . ."[3]

Another way to say this is that when children like themselves, they are free of self-preoccupation and can learn to like others. And, as they develop warm relationships with others, they come to enjoy interacting with others' ideas. Such children develop wide-ranging interests which generate many purposeful activities. The child with many purposes has, within these goals, the potential for rich problem-solving experiences.

In summary, it must be emphasized that skills in problem solving can only fully be realized by a person who, because he has a healthy self-concept, can meet problem situations confidently and creatively. Therefore, the elementary teacher who wishes to use a problems approach to teaching must first of all concern himself with creating an environment that permits the child to meet his developmental tasks with emotional support, in a curriculum that makes possible the success needed to develop and maintain the child's integrity.

Assumptions Underlying a Problems Approach

The problems approach in curriculum planning rests upon the assumptions that human beings are active, striving organisms, capable of self-direction; and, that it is the nature of man to be a satisfaction-seeker and a problem solver. Only the teacher with faith that every child, bright or slow, has the potential ability to solve his own problems can create the curricular situations that permit children to face their problems and grow, gradually, as a result of criticizing each experience.

Such a teacher will be concerned with helping each child refine his mental processes and become more efficient and consistent by learning to apply a scientific approach to serious problems in all areas of living. This teacher will plan to help each child define his problems, weigh alternative actions through consideration of all available means and ends, formulate hypotheses for action, and test those hypotheses in experience. By allowing a child to assume responsibility for his actions, and afterwards to reflect upon whether or not his anticipations proved themselves in fact, teachers help children build the skills for taking reasoned and intelligent action. These explorations take time. But from them come a fund of tested understandings and skills, available to children in each new problem-solving experience. The effect is cumulative—in the learnings acquired, and in children's growing confidence in their own powers for responsible, intelligent decision-making. Children learn to rely on inner strength, and not to depend solely on outside authority. They learn the functions of values in regulating action, and learn to bring values, too, under searching inquiry. Children learn to approach problems rationally, and to develop their capabilities for making and examining the many value-judgments a free society requires.

The Teaching-Learning Process: Developing a Climate for Problem Solving

Robert Thorndike has pointed out that a problem implies a condition of need and does not become a real problem until the child involved *recognizes* that need and wants to relieve it.[4] This places a great responsibility upon the classroom teacher. Some needs that require problem solving emerge naturally as part of on-going daily activities. These are what Thorndike calls the "practical" needs of daily living. Others are present but not identified by the children and have to be evoked by careful teacher-planning. Some problems which Thorndike names as "intellectual," while very significant in the lives of children and adults,—the need for peace, for example—must be dealt with at such levels of intellectualization that they require most careful groundwork before they are accepted by children (or adults for that matter) as *their* problems.

How does the teacher set the teaching-learning situation so that many needs emerge, are identified and accepted to be acted upon? The answer largely lies in the kind of learning environment the teacher creates. The problems-oriented teacher knows that he cannot teach directly for inventiveness, openness, or exploratory attitudes. These are behaviors that must be elicited *within situations,* within the context of problem solving. The teacher, therefore, must create the kind of classroom "climate" in which such problems, and their attendant behaviors, can arise.

Perhaps it is more difficult for the elementary teacher to create this climate than it is for teachers of older children. Young children are physically active and curious. Their emotions spill over easily and their controls are often immature. Because they are socially unskilled, they are frequently involved in interpersonal problems. These are the normal behaviors of children. Teachers and administrators who accept these as normal behaviors permit activity and "busy" noise.

Unfortunately, a tradition has grown up that the good teacher is the one who has a "quiet" room. Perhaps, in the beginning, and for too many teachers today, this was a necessity that grew out of the existence of large classes and too few appropriate instructional materials. There was also the mistaken notion that the learning process consisted solely of a child interacting with either a teacher or a book. As a result, many teachers are evaluated on the basis of the quiet and smooth routines of their classrooms.

Of course there are times when the nature of the task requires quiet, routine behavior. But problem solving, requiring an open search, invites verbal interchange, exploration, and the defense of one's position. Problem solving is the consequence of being frustrated or blocked in one's advance toward a goal. Such frustration evokes feelings—anger, wonder, excitement, urgency—with all their accompanying behaviors.

Problem solving is a challenge. How shall we proceed? This way? That way? If we choose this one, what then? Problem solving demands if-then thinking. Often it requires a series of explorations and the talking-through of outcomes, and the data obtained. We talk it out, sometimes quite heatedly as convictions slowly retreat or are revised in the face of the evidence. We learn by hypothesizing, experimenting, testing our conclusions in action, and, finally, reflecting upon the worth and value of the actions we took.

This procedure is contrary to an emphasis in elementary school programs on habitual behavior, on drill, and on repetition. In too many classrooms the "right answers" and coverage of many facts are the main values sought. When teachers reward only "right answers," children cannot afford to be wrong. They focus upon learning the answer, not on the search. They focus their energies on out-guessing the teacher, on predicting the one "right" answer the teacher has in mind.

If the teacher looks on learning as just covering so many facts, then of course he will feel he cannot take the time required for hypothesizing, searching, and testing ideas. To engage children in problem solving, teachers need, themselves, to understand that the process of search is as important to learning as are the answers learned. Only teachers who value the zest of the search and of discovery are likely to welcome the accompanying muddling and sometimes "busy" disorder of the method.

There are, of course, legitimate times for teachers to engage children in reception learning—in giving them answers, and in helping them rigorously test their ideas against known data in the adult world. To approach all learning, however, through presentation of "finished knowledge" at the expense of inquiry and open search, is to cut off, with serious consequences, the wider exploration and creative thinking the problems approach allows.

We have good evidence, now, that concept-learnings achieved through problems or "discovery" approaches in the elementary school years are remembered longer and are better available for productive new use (transfer) in new situations. We know, too, skills of inquiry and productive thinking must be practiced to be learned.[5] The problems approach gives continuing practice to both, and supports, therefore, a wider range of learnings than other classroom methods allow.

Teachers establish the conditions for such problem-solving learnings not simply by setting aside a time for a problem-solving lesson. They do so in the general climate they establish for learning. In this climate the teacher's behavior is crucial, and involves procedures such as the following:

1. *Encourage question-asking and respond to children's questions.* They are important and must be respected. By responding, the teacher demonstrates his faith in each child's ability to ask questions, define problems and do something intelligent about them. If questions are ignored or minimized, children soon stop asking them.

2. *Provide group attention for important questions.* A class, for example, is studying about truck farming in their surrounding area. They are discussing the irrigation system they saw on a study trip. John asks, "What will Mr. Petrovich do if there isn't enough rain to fill the reservoir?" Either explore this at the time it arises or record it on the chalkboard or a chart and set a time for further discussion.

3. *Follow-through, individually, with questions that are of more limited interest.* Jimmy is interested in rocks. In the Indian study he asks why turquoise is found in the Southwest. Jimmy can be helped to find appropriate materials to answer his question and can share his findings, if he wishes, with the group.

4. *Reward exploratory thinking.* Whenever children hypothesize or theorize about something, give recognition to this important process. Mary says, "When they learn to control the weather, I wonder what it will be like around here." This is worth brief, or lengthy, exploration depending upon the teacher's judgment of class needs. But the important point is that imaginative thinking receives recognition and reward.

5. *Help children to recognize that a search involves trial-and-error behavior.* When a mistake is the product of search, help the class to see that they have not failed; they have now learned that something will not work and must restate their plan (hypothesis) to further the search. For example, in the film "Learning Is Searching"[6] a third grade is explaining how they would make weapons if they had no tools or special materials, only what they could find in the woods. After trying to tie stones to branches of trees with grasses in order to make crude hammers, they face the fact that this device is ineffective. They then sit down to think through what other materials might be available and usable. They finally decide that strips of animal hide (leather) might work. They are now ready to explore the possibility and test it out.

6. Wherever possible, *emphasize the search along with the more routine learnings.* Organize both individual and group work for figuring out how a problem *might be solved.* Place the spotlight on how the children *think* a social problem might have been solved, let the class deal with it imaginatively *before* they find out what actually was done and *then* explore how it might have been done better. Use buzz groups and other small group devices to encourage children to work things out in many different ways. *Reward*

varied proposals and help the children explore suggestions through to the consequences of each. At times it will be wise to encourage multiple approaches to solutions simultaneously in different subgroups.

7. *Help the class to understand the importance of delaying action, whenever possible, in order to think the problem through.* When children make proposals for action, help them to think through (a) Is this a decision we must make on the spot?—or—(b) Is this a decision we can postpone, while we think it through and test it out? Ask such questions as "How do you know?" "Where can we find out for certain?". Help the class to see the feeling-doing-thinking sequence and try whenever possible to make this a feeling-thinking-doing sequence.

8. *Establish the understanding that not all problems are immediately solvable, but that we make progress by working on them.* Help children to tolerate ambiguity. This is basic to the search for new answers. Such attitudes may be built as the result of dilemmas reached in role playing or socio-dramatic situations.

9. *Make it safe to have ideas, try them on for size, and abandon them for better ones.* If children are not focused on always coming forth with the "right" answer, or on being the one who is right, but rather on doing hunch thinking, speculating, sharing of notions, we create a climate in which it is "safe" to be experimental.

10. *Provide opportunity for children to experience the realization that hypotheses can be proven false as well as true.* This again is basic to the scientific method and helps children to learn to tolerate ambiguity. In a culture that is absorbed with "happy endings" and panaceas for all ills, what could be more important than to help the young to understand and accept unresolved problems as one of the challenges of life?

11. *Wait for children to think.* Teachers get anxious when an immediate response is not forthcoming. By waiting quietly *and* confidently, you are telling children that you know they can manage the search.

12. *Demonstrate your faith in problem-solving thinking by participating in it yourself.* Admit to the children when you don't know something, hypothesize with them (But don't dominate their thinking!) and thus assure the class that adults don't have all the answers but also enjoy the everlasting search.

13. *Ask yourself continuously, "Does the curriculum I plan permit the emergence of problems that are real for the children* or is it so pre-planned that the class can only respond to teacher-given cues?". One does not learn to ask questions or pose problems when this is all done by the teacher.

14. *Be a guide to problem solving;* help children to postpone quick answers, to play with possibilities, listen to each other's ideas, seek out expertness, test out possibilities, and exult in the search.

Developing Problem-Solving Experiences in Elementary Schools

Guiding problems-approaches in elementary schools requires understanding of the thinking processes involved.

A Definition

McDonald has stated that "A problem exists when there is a goal to be obtained, but the individual sees no well-defined, well-established means of attaining it, or when the goal is so vaguely defined or unclear to the person that he cannot determine what are relevant means for attaining it. . . ."[7] Thorndike suggests that "Problems are of all levels of complexity, scope, and subtlety. . . . But they all have in common—three elements—

1. The individual is oriented toward a particular objective and motivated to reach it. He has an end in view.
2. Progress toward the objective is blocked.
3. Available, habitual response patterns are not adequate to permit the individual to surmount the obstacle and proceed toward his objective."[8]

An Example

Mary Beth is five and in kindergarten. She is busy building a house with blocks. She needs a long block to finish one wall. To her dismay the block cupboard is empty; all the blocks are in use. Looking around she sees that Timmy has some sitting beside the structure he is building. Mary Beth walks over and takes a block. Timmy seizes the other end of it and protests, "That's my block. I need it!"

Mary Beth has a problem.

As the youngest in her family, she has been indulged at home. Suddenly, the habituated behaviors that work for her at home are not adequate. She needs new ways of meeting a situation that is somewhat like her experiences (building with blocks, facilitated by older brothers and sisters) but involving a new ingredient (sharing with other five-year-olds).

Mary Beth's problem has many elements in it. It is a complex situation in which (1) her desire to build a house is blocked by lack of materials; (2) her effort to get the needed block has created conflict with Timmy;

(3) she is frightened by the conflict and begins to cry; and (4) she lacks experience, emotional control *and* skills for solving her problem. It may be further complicated by the possible fact that Timmy really needs his block to finish his structure.

It is obvious that the teacher guiding this situation cannot simply take the children sequentially through a series of "steps" in problem solving. She will have to help the children cope with the situation in a psychological, rather than a logical sequence. What she does depends on the amount of emotion invested in the situation (Mary Beth's tears, Timmy's anger), the amount of experience present (the give-and-take of kindergarten life), and the level of ability to think this through.

Having recognized and accepted the emotions of both parties ("I know you need one more block, and Timmy needs his too!") the teacher may sit down with these two and ask questions to help them think this through or she may ask all the children in the block corner to help. She asks each child to describe his situation. She asks all the children "What can we do about this?" Various suggestions are made. The result:

1. Feelings are recognized as a part of the content of the situation.
2. The children are helped to define the situation and the needs involved.
3. It is suggested that:
    a. Mary Beth might take one block off the other three sides and make a shorter house
    or
    b. John volunteers a block he doesn't need
    or
    c. Two short blocks are fitted together to make a long one.
4. The point has been made that both respecting the work of others and sharing are important ways of working.
5. And, finally, children are being introduced to the elements of problem-solving procedures.

At this maturity level, the process is often partial, incomplete, or only understood by a few children. Such interpersonal problems are the daily content of learning to live in groups in school.

Teachers who would create with children a dynamic development of continuing problem-solving experiences need to understand the logical processes of problem solution. Individuals probably will not each time follow these processes in a sequential, step-by-step manner. But unless we know what the steps are and how they relate one to another, we cannot creatively move with them nor intelligently depart from them, whichever the wiser course may be.

Thorndike has utilized Dewey's five steps in the complete act of thought to develop an analysis of the problem solving-process and reminds us that this ". . . analysis is neat, logical and sequential. Actual behavior in response to a problem situation is often confused, illogical and disorderly. Furthermore, each problem-solver and each problem to be solved has its own individual characteristics. Diversity rather than uniformity is the rule in the attack on problem situations. We do not find the problem-solver going neatly and logically through the sequence of steps. . . . Rather, he jumps around, often starting in the middle, returning then to the initial steps, moving back and forth between hypothesis, problem clarification, appraisal of implications, and hypothesis again. Some of the phases outlined may fail to appear, as when an hypothesis is put into action without previously thinking through what it means or implies."[9]

This statement serves as a reminder that the teacher's role is always a difficult one of assessing what is happening, deciding when to keep hands off and let the child or group find its way through the process, or, deciding that it is necessary to step in and guide the children to more skillful behavior.

INQUIRY EXPERIENCES

Sometimes, as in the example just reviewed, problem solving is initiated through examining the personal-social problems arising in day-to-day experiences of school and community life. In elementary schools these are important experiences. They open opportunities for inquiry into conflict and conflict resolution in children's social encounters, and they establish indispensable bridges to later inquiries into the larger societies of man.

In elementary schools inquiries also arise in a variety of classroom encounters provided for in social studies units of work. Sometimes these encounters are teacher-planned. Sometimes they arise because of children's interest in some discrepancy, uncertainty, or unresolved problem in a situation already underway.

One fourth grade class, for example, engaged in a study of historical California, noted in the present-day landscape the fact that towns of the gold-rush days had not all been urbanized in the century since. San Francisco and Stockton, they observed, were large urban centers today. Angels' Camp and Coloma were not. It was this observation that launched, in this particular classroom, inquiry into factors of urbanization. In first defining their problem—"Why did some towns become cities and others not?"—and then responding to it children formulated hypotheses based upon some previously learned facts, but facts organized and applied now to a question they had not earlier encountered. Their suggestions included, among others, availability of water supply, or harbor facilities, and of income sources through agriculture and trade. Comparing one town with another, on one or another of these criteria, the children realized a need to systematize their data in some more visible form. The teacher assisted, and a chart was designed which allowed for multiplicative classification on a two-way grid.

	Towns That Grew		Towns That Did Not Grow	
Factors	*San Francisco*	*Stockton*	*Placerville*	*Angel's Camp*
Water Supply				
Harbor Facilities				
Agricultural Resources				
Mild Climate				
Terrain				
Etc.				

Children realized their suggestions were hypotheses only, and that some explicit criteria were needed for establishing their relevance and accuracy for explaining urban growth. They checked data against authoritative references in the classroom, and appropriately classified them in the categories of the table. They determined on comparative analysis as a method for differentiating between those factors which regularly occurred (or did not occur) in "towns that grew" and "those that did not." A ready water supply and harbor facilities seemed strongly to differentiate the two classes of towns. Climate did too, since these children chose to define the coastal region as considerably milder than the hinterland to the east. Summarizing these factors, children established a "tentative theory of urban growth."

Inquiry continued a second day, as children summarized the factors they had observed, and attempted to apply their theory, now, to new instances. "If our idea is correct, should it explain why other cities grew, as well?", the teacher asked. They agreed, and proposed applying it to Los Angeles, an urban center selected for its obvious growth.

Did Los Angeles have a water supply? Only by negotiation, but the Owens River Aqueduct, they agreed, served its purpose well during a period of rapid urban growth. And a harbor? Man-made, but definitely a major world port. Climate? Mild. The theory seemed substantial, and predictive of urban growth. Children volunteered to examine further cities, this time selecting for individual study such cities as London, Paris, Moscow, Tokyo, and Rome. One child volunteered almost at once a revision of their theory. No longer did a mild climate seem critical, once Moscow had been joined to the list. As he pointed out, climate here was hardly mild, yet the city had grown.

Thus, over several days' time, children extended their study, encompassing new data of urban development, in times past and of cultures not their own. Over time, such data were amassed, categorized, and interpreted; new hypotheses extrapolated and tested; and, their theory extended and refined once more.

Within this series of lessons, a major generalization grew, first from *facts,* then through *groupings* (categories) of facts, to, finally, an overriding *relational statement,* a theory of urban growth.[10] Just as important, skills in inquiry were developed. They included: (1) *Defining the problem and the terms* introduced as the inquiry was launched—terms such as factors, urban development, and resources. (2) *Constructing a model of search,* in this case a strategy for obtaining needed data concerning the towns, and their factors of growth; and, for extrapolating from those data some relational constructs or hypotheses, to be tested again under teacher guidance, in new instances of urban growth; (3) *Obtaining authoritative data,* in this case through historic and encyclopedia resources available in the classroom and the school library; (4) *Deriving conclusions, and specifying the criteria* for acceptance or rejection of the hypotheses earlier formulated and directing this research—in this case, through testing correspondence of factors in towns that grew and those that did not. (5) *Relating these findings into a larger theory structure,* an extension of earlier knowledge outcomes to formulations of considerably greater power or usefulness. In this case, subsequent investigations, undertaken on succeeding days, supported theory extension and refinement.

Problems explored in this manner take time. Their advantages lie in the higher organizations of knowledge (concept-objectives and generalizations) they produce, and the methods of inquiry they support. Lee and Lee report an analysis by William H. Burton of the steps involved in problems situations such as those we have discussed.[11] They require:

> A period of inquiry, long or short as the case may be, in which the confused, indeterminate situation is transformed into a unified and determinate one.
>
> a. Plans are made and remade, abandoned, adopted.
>
> b. Terms and limits are defined and redefined.
>
> c. Suggestions arise from many sources and are deliberately sought for in others.

d. Discussions, arguments, differences of opinion, exchanges of fact and belief take place.

e. Digressions, blind alleys, useless suggestions and leads intermingle with valid and conclusive items.

f. Careful inferences from data, hunches, insights, and bold guesses intermingle with one another.

g. Much time is consumed, and much scrapped thought is characteristic; the errors indicated in previous points are not always recognized immediately, nor are the correct leads; right or wrong points must often be pursued for some time before validity or lack of it is determined; many schemes for analysis, for comparison, for organization are made, improved, or abandoned.

h. Devices for testing, checking, evaluating appear from the very beginning; are laboriously constructed, corrected, abandoned, adopted.

These processes are important both to the resolution of social problems, and of intellectual inquiries such as those we have just examined. These processes of inquiry or problem solving are, in short, highly generalized skills. They are an important method for finding one's way through new and unknown situations. They transcend any particular subject matter field. They are increasingly recognized as an *operational definition* of productive behavior and of intelligence itself.

SOME GUIDELINES TO TEACHING PRACTICES

Certain guidelines are helpful in developing classroom experiences in problem solving or inquiry. They include the following:

1. *Plan for or capitalize upon emerging problems* that permit children to become involved in situations that demand problem-solving thinking.

2. *Guide children by asking open-ended questions that help them to define their problems and some methods of attack.* (Avoid the limiting, leading questions that cue children in, immediately, to the question you have in mind. Give them a chance to think for themselves!) Some good questions, for example, include:

What is our difficulty?

What is happening? How can we help?

How can we know for certain?

Are you in trouble? What is the problem? Do we need to restate it?

Do we need more information? Where can we find out?

How will this work? How will people *feel*?

What do we do if this idea doesn't work?

Questions are posed in order to help children think and plan for action and to help them test out their ideas.

3. *Give time to defining the problem explicitly.* Accepting the first problem-statement a child offers, and hurrying at once into steps for obtaining a solution may leave many children far behind. For children old enough to read, it is helpful to place the problem or question on the board, to examine the terms, and the adequacy (and importance!) of the question, as asked. Does it get to the heart of the problem? Is it researchable, as it is stated? Is it *worth* investigation? Especially important, what assumptions are built into the question, as worded?

One of our authors recently visited a classroom where children were engaged in seeking resolution of the problem-question, "Were the Indians better off before or after the white man came?". This teacher gave considerable class time to defining the terms "Indians," "white man," "before," and "after." But she completely ignored defining the term "better off"! By whose standards and on what criteria were children to judge? In this lesson critical assumptions went unexamined, and values unchallenged. A lesson that might have developed as an interesting inquiry into cross-cultural perceptions foundered for want of an important step in analysis and definition.

4. *Engage children in constructing a model of search,* a strategy of inquiry appropriate to the problem to be resolved. What kinds of data will they need? What sources will they consult in generating hypotheses, and establishing their relevance? Through what means will they submit their hypotheses to test? Increasingly, through the grades, these strategies can be made explict, and children can accept more responsibility for suggesting methods of search in their inquiry approaches.

5. *Provide authoritative data,* and the skills lessons needed for data gathering and analysis.

Printed materials, historic documents, pictures, films, charts, and maps

Teacher-prepared materials when printed information is at a too-advanced reading level

Study trips

Resource persons

Systematic instruction in the use of research procedures

Discussion and interpretation of findings, helping pupils to:

(a) Organize and share information

(b) Analyze the data—discriminate between fact and opinion

(c) Recognize that feelings and past experience influence how we understand and use data

6. *Help the children to respect each child's idea,* no matter how slight it may seem.

7. *When majority decisions are made for action, help the children to see that the minority viewpoint sometimes may in the end be the most helpful.* Develop ways of treating minority views:

(a) Record them on a chart for future reference.

(b) When possible, get the minority view tested by an individual or group as an alternative hypothesis.

(c) When necessary, protect a correct or worthy minority proposal by engaging the group in further consideration of it.

8. *Help the children to see that there are times when holding your own viewpoint and declaring it, even when it goes against group opinion, is very important.*

9. *Help children to cope with conflicts of opinion constructively.*

(a) Ask them to explore each other's reasons for their opinions.

(b) Let others react to the viewpoints of their opponents, at the same time respecting their difference.

(c) Ask each person to state the other person's viewpoint before further argument.

10. *Help children to analyze what happened in a problem situation.* Draw from them simple statements of the principles involved and invite generalizations. However, realize that sometimes *time* is needed, or even further experience, before the children can arrive at a generalization level.

Many problem-situations in which we place children in school may be resolved by either individual or group action. Group problem solving will depend upon the kind of leadership given the group. With young children and with older ones who have little experience with such group work, the teacher must take an active role. Increasingly, as children experience the process and grow in skill, leadership will emerge or can be assigned within a group, with the teacher contributing in a less direct way. However, the teacher must retain for herself the responsibility of protecting the individual from the group, helping the majority to respect the minority opinion and give it due consideration, and of stepping in to take over leadership when children reach the limits of their skills and knowledge.

The teacher must at times be quite directive, at other times non-directive. She is directive when she guides children into problem-situations—by asking questions, by setting the stage so as to permit problems to emerge, by planning problem-centered units. She becomes non-directive when children are facing the question or problem they need to resolve; when they are doing their own thinking. Then she uses the non-directive techniques Axline[12] delineates, the method of reflecting back to the children their feelings. She may say "You are angry!" and the child says "Yes, I'm angry because. . ." and a situation gets defined. She may say "You don't know what to do. . ." and thus guide children to think further about what might be done. Or, the teacher may ask "Are you saying you need more information?", thus helping children to put their confused exploration into focus.

It must be remembered that some children are so conditioned to adults performing an authoritative role that they may resent having to assume responsibility for themselves. Understanding the prior history of reinforcements children have known is necessary to effective guidance in the new situation. Bridging from authoritative classroom management to these more open problem-solving techniques will require careful attention to the "reinforcers" that reward children's new efforts in thinking for themselves, and engaging in the search for problems-solution.

It is our thesis that young children, in order to become problem-solvers, need to live in an environment in which the teacher acts as a problem-solver model by being an active inquirer herself and demonstrating in her daily decisions that she is open to new experiences, to hunching, to testing out ideas and, often, changing her opinions. We also believe that young children must first experience problem solving as a way of meeting situations which are real for them—Mary Beth and the block, for example—before they are ready to discuss more abstract intellectual problems and test them out verbally. Too often teachers pose problems for children at the verbal level when the children first need concrete experiences with problem solving.

In the following section a number of different categories of problem-solving situations are illustrated. The first category consists of problems which emerge out of young children's activities as they use materials and media to explore their own ideas about the environment. They may or may not be social problems of the wider society; they may be problems of sharing tools and materials or of how to construct an object or of resolving playground conflicts. It is our contention that learning to define a problem, to consider alternatives, and to test out ideas starts at this multipurpose level and is the base upon which we build the ability and disposition to gradually be concerned with the more abstract social problems.

Another category of illustrations is the product of some of the recent experiments with teaching the modes of inquiry of the social sciences. It is concerned with teaching inquiry procedures that, while applicable across the social sciences, have their roots in behavioral science procedures. The work of Ronald Lippitt and his associates, of Ralph Ojeman, and Fannie Shaftel are illustrative of this "skills training" in social inquiry.

Our last category is focused on lessons which illustrate problem solving in interpersonal and intergroup relations and in intellectual social content areas. Here we emphasize a two-pronged approach to problem solving in the social studies: a conviction that the child must (1) learn to *act* on problem-situations typical to his own life in order to become a decision-making citizen and (2) become increasingly concerned with the value decisions that underlie proposed solutions to the wider problems of society.

Examples of Problem Solving

In the elementary school we are faced with a wide range of maturity and experience with problem solving. Children bring problem-situations to school with them and they create situations in school as they try to meet their developmental needs. The teacher can and must capitalize upon these. But she can do much more than this. She can *plan* for problem-situations in the curriculum. She does this both within the *content* of her program and through her *methods* of teaching. If she is focused upon teaching children primarily information in expository form—chapters in books, workbook exercises, etc., there will be few opportunities for genuine problem-situations to emerge. If, however, her curriculum involves children in broad social studies enterprises (experience units, community and school service projects, etc.) which require decision-making, group work, experiments exploring life processes, and inquiry-centered projects, the opportunities for problem solving are greatly increased. In these learning settings, the elementary teacher will have opportunities that have real implications for method. Will the teacher do all the planning and evaluating, or will she pre-plan in such a way that teacher-pupil planning is a part of her methodology? Will work-periods be so routinized that there will be no conflicts; everything runs smoothly? Or, as part of her methodology, will the teacher deliberately allow her class to get into difficulties (and tolerate the initial disorder!) in order to provide for some problem-solving situations? Will children be so involved in study units that they can generate their own questions, plan the search, and formulate and test out their ideas?

Example One

In the kindergarten situation, cited earlier, we see rudimentary problem solving emerge when Mary Beth takes the long block from Timmy. Here is the beginning of problem definition. "I need this block!" says Mary Beth. "I do too!" says Tim. "What is the problem?" asks the teacher. (She could simply enunciate a rule—"We do not take other people's blocks!" But, being problems-oriented, she asks the question.)

Exploring the situation.

"We both need the block! There aren't enough blocks."

The problem is beginning to be defined.

"What can we do?" asks the teacher. "Shall we ask the other children to help us?"

Guiding the children to consider possible solutions.

In the suggestions that follow, children are learning to think in terms of alternative solutions and in terms of consequences—to people, to the construction project, etc.

Evaluating the data (proposals).

Finally, the teacher may ask Mary Beth, "What do you think you can do that will settle this?" She may help the children to generalize (if she judges that they are ready for this). The generalizations may involve people's feelings—when they are frustrated, when someone takes something from them—and also some ways of improvising or compromising when materials are scarce.

Drawing conclusions for action.

Building generalizations for future behavior.

Example Two

Here again is an example of a broad unit where a construction activity demands (1) conceptualizing (a tug boat), (2) a plan of construction, (3) a problem (wrong design), (4) alternative lines of action. There is both social studies content and experience in problem solving at a point important to the child. The following episode occurred in a combination first and second grade. The children were evolving a classroom harbor community on the floor. They had homes, streets, and a beginning harbor. They had decided to build boats for their harbor. Every child, or teams of two children, had each chosen a different kind of boat to make.

As Mrs. A. circulated during the work period she made notes of various needs and difficulties evidenced by the group. At the close of the work period the children brought their constructions and sat in a semicircle on the floor, facing the teacher. They took turns reporting their progress, describing next steps and asking for and receiving suggestions from the class.

Mrs. A. asked Peter to show his work. (Peter was unaware that he had a problem.)

"I am making a tugboat. This is the base of my boat." He holds up a piece of wood that he has sawed so that it is pointed at both ends.

Sometimes the teacher has to help a child discover he has a problem.
Exploring the situation.

There is a moment of silence. Then John blurts out "Peter, that can't be a tugboat! It's pointed. Tugboats are rounded at the ends!"

Peter insists "They are not!"

It is difficult to face mistakes.

Other children affirm that tugboats are rounded.

Lucy rushes over to the bookshelves, seizes a book on boats, opens to a page on tugboats and confronts Peter with a picture.

Data to prove a point.

"You see, Peter, it is rounded. It has to be, because tugboats push other boats."

Evaluating evidence.

"Why must they be rounded if they push other boats, Lucy?"

The teacher guides.

Lucy reads to the class a brief explanation of the work of tugboats and why they must be rounded so as to not punch holes into the ships they push.

The data are in.
(Sometimes children can supply information. Sometimes the teacher must provide it.)

The teacher has stepped to the chalkboard. Through a guided discussion, she records the children's statement on tugboats, the work they do, and why they are constructed the way they are.

Tugboats are work boats.
They push ships into the harbor.
They tow barges.
They are rounded so they won't push holes in ships.

"Peter, can you see now that if your boat is to do its work, it must be rounded?"

Helping Peter face his problem.

Peter nods his head dolefully.

"What do you think you might do?"

Helping him begin to explore possible solutions.

Poor Peter is stumped, for the moment.

"Does anyone have any sugestions for Peter?"

"He might start another boat."

The suggestions are numerous.
(alternative actions)

"He doesn't need to do that; he can saw off the points and round them with a wood file."

"He can turn it into another kind of boat, a pointed one."

"These are good ideas!" comments Mrs. A.

Giving recognition to ideas.

"Peter, your friends have given you many suggestions. Do you think you can use one of them, or do you have other ideas? What do you think will work?"

The teacher again helps Peter think his way through to a choice. The choice is his.

"I like John's idea—to saw off the points."

"I'll help you, Peter" volunteers John.

The choice is made: a plan will be put to test.

After the rest of the discussion is completed, the teacher follows through with the chalkboard chart. Peter, and others at his reading level are invited to read the story together and discuss it. (Tomorrow it will appear as a completed chart on tag-boards and someone may draw a picture to illustrate it. Perhaps Peter?)

The reasons are reinforced with further follow-up.

The final test, of course, will be the revised boat.

The above illustrations have all had genuine problem-solving elements in them—the demand for consideration of novel elements or value judgments—with considered consequences. While its focus is on solving a construction problem, this task occurs in a social studies unit that precipitates problem-solving situations.

Example Three

The following is an example of inquiry that illustrates the development of a model of search and of testing out of an idea.

This third grade class[13] was studying their extended community—the San Francisco Bay Area. They were concerned with San Francisco Harbor, its shipping, and the cities that surround it. They had constructed a model harbor on the floor of the classroom and, in dramatic play, were loading and unloading cargo, and bringing ships into the harbor. This activity had resulted in a study of harbor traffic and regulation. As oil tankers were brought in, the class discussed their function, where they went, and how and where they emptied their tanks. They learned that sometimes a tank captain, in a hurry to ship out, would break the rules about emptying his tanks and empty them into the bay. Oil slicks would result. The Coast Guard would then have to clean it up. The children discussed this need to clear away oil slicks. They recognized that oil in the harbor might kill fish, cause a fire, dirty-up beaches, etc.

Then the question was asked (this time by the teacher; it could have come from a child): "Do you know *how* the Coast Guard does this clean-up job?". No one knew.

"What do you *think* they might do?"

The hypothesizing began! These eight-year-old children, who live in a research-centered community, had many technical notions. The teacher filled two chalkboards with their ideas, some of which were:

1. They have a huge pumping system that separates the oil from the water and discharges it somewhere.
2. They have a machine with an oil-finder device that skims over the water.
3. They have some kind of vacuum.
4. Etc.

Each idea was discussed. The children recognized that some of their ideas might be very expensive.

"Now, how can we find out what actually is done?"

Sources of information were listed:

We can:

Look in our books

Ask Mr. Morris (a retired merchant marine captain)

Ask the Coast Guard.

The teacher suggested that everyone do some checking of resources in the room, in school libraries, with people they know, and report back. It was evident the next day that local resources were not adequate. Because these were young children and time was a factor, the teacher volunteered to find out for them from the Coast Guard itself.

The next day the teacher was ready. She had prepared an explanation on large tag-board charts, so that all children (slow and fast readers) could participate in a research reading experience.

The class reviewed their hypotheses. Then the teacher said, "I think you are going to be very surprised when you read what they do. Actually, you had much more scientific ideas. Their methods are rather old-fashioned."

She then uncovered the first chart and they read together. It was a simple description of how oil gets spilled in the harbor. The second chart they read supplied the needed information:

> When oil is spilled in the harbor waters the men must work fast.
>
> Men row out into the water with a spill boom.
>
> A spill boom looks like a big hose.
>
> The spill boom is made of canvas and cork.
>
> The spill boom will float.
>
> The men make the spill boom go all around the oil.
>
> The oil stays inside the spill boom.
>
> Other men go out to the oil in row boats filled with straw.
>
> They row inside the spill boom and put straw in the water.
>
> The oil sticks to the straw.
>
> The men pick up the straw with pitchforks.
>
> They put it in the row boats.
>
> A truck takes the straw from the dock to be burned.
>
> The oil is gone! The harbor is clean again.

The children, after much discussion, recognized that this simple device had a low cost and might actually be more practical at this time.

At this point, the teacher said, "I thought it would help us understand this process if we experimented with it ourselves." She brought out a dishpan filled with water, a jar of oil, and a miniature spill boom which she had made of canvas and filled with cork, some straw, and a fork. The children then went through the process of spilling oil on the water, surrounding it with the spill boom, tossing in the hay, and mixing the hay around to pick up the oil. The hay was then picked up with the fork, and, theoretically, rowed back to shore to be discarded.

The teacher had used a number of media to help young children do research to answer a question, using problem-solving procedures. The teacher ended the session with the remark, "When you grow up, perhaps one of you will invent a way of doing this that will be far better than the one that is in use now!"[14]

Example Four

Fox, Lippitt and Lohman have been developing social science materials for elementary school children[15] focused on developing in the student an appreciation of the method of scientific problem solving and on providing opportunities for the student to create or utilize the skills and tools of scientific activity. They propose to include in the social studies curriculum materials on human behavior and motivation, social interaction and group behavior. They select content that (a) has core significance in social science disciplines and at the same time (b) has meaningful relevance to the student's current experience, interests, and level of development.

This program has developed a unit approach with the following phases:

Phase One:	Warming up to the topic. A problem area is identified and its relevance to the pupils' own lives is explored.
Phase Two:	A specimen of behavior which sharply presents the problem is delineated in the form of a brief role-playing episode.
Phase Three:	Data is collected by observing the role-playing episode.
Phase Four:	Data collection teams organize their findings and present their data to the class.
Phase Five:	Causes for behavior are explored. Through class discussion a "theory" for the behavior is developed.
Phase Six:	Consequences are evaluated. Children propose and defend their judgments and alternatives are proposed.
Phase Seven:	Hypotheses about alternative behavioral sequences are developed and tried out.
Phase Eight:	Children and teacher draw conclusions and list generalizations.
Phase Nine:	Question is raised as to how social scientists have studied these same questions and the research is examined.
Phase Ten:	The relevance of classroom discoveries to other life situations is explored.
Phase Eleven:	The unit is evaluated.

The following is an example of a behavior episode:

Unit on Younger-Older Relations

Characters—Tom and Jim Pete and Fred
Older boys Younger boys
Scene: A street running past Pete's house.

Two third-graders (Pete and Fred) are sitting on the steps of Pete's house trying to mend a broken bat. Pete has gotten some tape from the kitchen drawer. They are not having any success and have made a mess of the tape. It has been raining. The sun is out now, but there are puddles on the street. Two older boys (6th grade), Tom and, Jim come up the street, hurrying to get to a vacant lot to play ball. They have a bat, ball and glove. They are talking about how glad they are it isn't raining and how little time they have left to play before dinner. Fred sees the bigger boys and says he's going to ask them to fix the bat. Pete says they won't help smaller boys about their "baby bat" and what a mess they've made trying to fix it. The second older boy, Jim, wants to get to the ball field. He doesn't want to be bothered with little kids. Tom is enjoying teasing the younger ones. He takes the broken pieces of the bat over to show his older friend. The young boys try to get it back. Pete steals around behind Tom and snatches the bat. Tom runs after him and Fred gets in front of Tom and stamps in a puddle, getting the big boy wet. Both smaller boys run into the house. Jim, the second biggest boy, urges Tom to come along and not bother with little kids. Tom yells toward the house where the younger boys are "Just wait till I get you for this." He goes off up the street to play ball.

In the actual presentation of the episode (role-played by children trained by the teacher), the episode is first played through so that the entire class can see it. It is then acted a second time after the class is divided into groups and each group is given a special character to observe. The groups now go to different parts of the room to discuss questions the teacher has given to the leader of each group. After five minutes of such discussion, they come back for general discussion.

On the board, the teacher writes the questions, one under the other. In five columns she writes the summarizing comments made by the groups.

For example:

Question	*Tom*	*Jim*	*Pete*	*Fred*	*Interaction*
How did he feel about what finally happened?	Likes getting even	Puzzled	Mad Bad Scared	Scared	Olders unfriendly four times. Youngers unfriendly to olders two times. Olders friendly to youngers twice.

The participant observers are eager to express ideas. The discussion moves along without teacher pushing.

The next phase of this procedure is to interpret cause and effect in the behavioral specimen. Each child is given a sheet that looks like this, except that it takes a whole page so that many causes may be recorded:

Finding Out Why

Cause	Effect
1.	1. Fred asks _____ _____.
2.	2. Tom ____ and takes ____.
3.	3. Pete ____________ bat.
4.	4. Tom __________ Pete.
5.	5. Fred __________ Tom.
6.	6. Tom shouts "________!"

Among the causes given may be, for example:

1. *Why did Fred ask for help?*

   He realized Tom was older.
   He thought olders would like to help.
   He wanted to play ball.
   He trusted his big brother.

2. Etc.

The children are next asked to fill in work sheets focused on *Things We Liked* and *Can We Tell Why?* and *Things We Did Not Like*. This is titled "Placing values on consequences."

The researchers report this the most difficult task for the children. The cooperating teachers have expressed the desire to work on decision-making for next year.

In the next phase, *Exploring Alternative Behavioral Sequences,* the children are presented with the concept that there may be many "correct" ways to accomplish one's ends, not just to use one solution that is always best.

The teacher may ask, "If we changed the actions, would the outcome be different?" "Whose actions could we change?"

After general discussion, the teacher may guide by asking what would happen if the younger boys refused to be teased by Tom's actions. Sometimes the children decide to act out alternatives to see if they would result in better feelings all the way around.

Alternatives which are acted out may then be listed on the board. At the next class session the class may be given dittoed sheets that read:

> We watched a behavioral situation and saw that it did not end with a happy feeling. The boys did not even do what they started out to do. We decided we could change the ending to make a better feeling. We did this by changing the actions of just one person.

The alternatives proposed by the class are listed on the left hand side of the paper. A box in which to check "will" or "won't" is placed on the right hand side of the paper corresponding to each alternative.

The children are asked to mark which alternatives they think will make for better feelings all the way around. After they mark their papers they vote on these.

The teacher may finally guide for generalization, helping the class in discussing that a generalization is composed of many facts and a "meeting point" which brings about a generalization. In such a discussion, the authors report:[16]

". . . . They began to discuss generalizations they had derived from facts learned in social science.

One girl said, 'Your ways can be changed.'

'How do you know?' asked the teacher.

'We did it and it changed the whole thing.'

'You've learned people are able to change their ways?' Mrs. Smith asked.

'We've learned to change people around,' said another boy.

'I'd hate to think I'd spend the rest of my life changing people,' said the teacher. 'We have discovered that if one person makes a change in a situation it can change a lot of things, sometimes—but you are the one person over whom you have control. Are there any situations at home between you and older and younger brothers and sisters where feelings are not pleasant? What might you try to do differently that would make for better feelings?' "

The children may then report on bickering situations and may act out a situation that seems to bother many children in the group. Thus the relevance of this problem-solving lesson to other situations is established and application is made in terms of the students' own lives.

Fox, Lippitt and Lohman believe that it is fully as important to teach the young student applications of scientific methodology to study and understanding of human phenomena as it is to the study of biological and physical phenomena. They emphasize in their procedures the importance of helping the child distinguish between the objective analysis and interpretation of phenomena, and the making of value judgments about the phenomena. Their project is a creative demonstration of using key dilemmas of childhood as take-off points in the study of scientific methodology and behavioral science content. As is evident, their inquiry methodology is essentially a problem-solving procedure.

Other Modes of Inquiry in the Social Sciences

There is a growing interest in inquiry procedures that involve students in decision-making-in-action. These primarily take the forms of role-playing, simulation and gaming which are all essentially built on the same principle. What is involved is the construction of a model which may be symbolic (pictorial, verbal) or physical, and presents all or some aspects of a social or psychological process. Such a model must have a high degree of reality and must respond in a manner comparable to that of the behavior of a real system.

The function of social science is to formulate theories that explain and predict human behavior. Simulation is a very useful device for this exploration of verbal theories and the testing of hypotheses—for the reason that it is often impossible to subject an actual group of human beings to experiments. By simulating the significant variables it is possible to explore such phenomena by experimenting with the simulated system. In these simulations students make decisions, handle data, and experience consequences comparable to those which occur in the real system.

Role-playing or sociodrama which is a form of group problem solving focuses on handling data (a problem-situation), making tentative decisions in choosing among alternatives, experiencing consequences, (going through enactments in which consequences are delineated), and making final decisions (choosing in the light of consequences). The following is an example of role-playing a problem story focused on responsible behavior.

Example Five

The teacher reads a story to the children which stops at the dilemma point. She then invites the children to finish the story as they think it will end. (This is an invitation to reality exploration.)

The story,[17] in brief, tells about a sixth-grade class who are caught by their teacher, Miss Hendry, cheating in a frantic attempt to win a city-wide school paper drive that is being sponsored by the Junior Chamber of Commerce. The children have been hiding pieces of junk between the papers, to increase the weight. Before the teacher can confront the class with her discovery, the winner is announced. It is her class! When she accuses the children of cheating, they say they did it because the runner-up, a sixth grade in the Wilson School, has been cheating, wetting their bundles, then covering them with dry paper. The teacher stopped.

P.	Oh! Oh! Are they in trouble!	
T.	What will happen now?	An open-ended question. The teacher uses "will" rather than "should" to invite reality exploration.
P.	They'll have to give up the prize.	Generating ideas about the consequences to the class' actions.
P.	That isn't fair. Then that Wilson class will win and they cheated too!	A judgment.
P.	I don't think they should give up the prize. They only did it because the other class cheated.	Reviewing the data.
T.	Are you saying they had to cheat because the other class was cheating?	Reflecting back an idea.
P.	No, they didn't have to.	
P.	Yes, they did. Their class had a right to win. They'd worked hard.	Rationalizing a wish.
T.	What do you think will happen now?	Guiding for next-steps.
P.	I don't think Miss Hendry will let them keep the prize.	
P.	Well, it isn't really right.	A judgment.
P.	She should go see the Wilson teacher, then, and keep them from winning by cheating too.	A proposal.

The teacher then asks for details on what will happen if Miss Hendry goes to see the Wilson teacher. A role-playing enactment is set up at the Wilson School. The two teachers talk, the Wilson teacher says she will talk this over with her class and confront them with the accusation. End of enactment.

T. What will happen now?

P. The Wilson class will say they didn't do it.
P. My brother saw them doing it!
P. No one can really prove it.

Pushing for further consequences.
Further reality exploration.

Another enactment is set up. The Wilson class first denies the accusation. Finally one child says "Well, yes, we did it." The observers agree that "Somebody usually tells."

T. What is happening here?

P. Well, the truth is out. Nobody can get out of it!
T. What will happen next, then?

Pushing for further definition of the situation.
Facing up to consequences.

The class agrees that neither class can accept the prize, that they must go to the Chamber of Commerce and confess. This is enacted in another role-playing incident.

In this experience, children are precipitated into a simulation: a problem story, which delineates, with careful detail, a series of events which end in a dilemma. The problem is defined, first in brief discussion, then *in action,* so that the transactional aspects of the situation emerge, feelings and rationalizations are explored, and, eventually a fuller definition of the situation is developed. At this point alternative lines of action are proposed. In the example just given, one such proposal was explored. In other classes, several other lines of action have been proposed. (Go to the picnic—the prize—and confess afterwards! for example.) Because says one child, "If you was poor like us and had never been on a picnic, you'd want awfully much to go."

This is problem solving. Here children struggle with the dilemmas of interpersonal relations, their responsibilities as citizens, the ethics involved in competitions. Is loyalty to your own group paramount? Do you have a larger allegiance to society? Elementary school children, working to become accepted members of groups, need such confrontations as aspects not only of personal growth but as a phase in political socialization.

Example Six

A social studies unit that is designed to encourage inquiry provides much opportunity for using problem-solving procedures.

5th Grade: *Why is the Great Basin a Desert Region?* (A Problem in Physical Geography: illustrative of using problem-solving procedures to explore information purposefully.)

A fifth grade class studying the westward movement of the pioneers from the Mississippi to the Pacific had been planning the route of the trek westward across their U.S. maps. As they traced the trail across the Great Basin, the children learned of the new hardships the pioneers faced in this desert environment.

Child: They couldn't get water now. The water had alkali in it and sometimes they even found dead animals in the water holes.

Child: That was because the water was poison water and the animals died.

Child: I found out that sometimes other pioneers left junk in the water holes, like furniture and things they couldn't take along.

Teacher: Besides the poor condition of the water holes, is there any other reason the pioneers were short on water here?

Child: Well, there weren't any rivers.

Child: There's the Humboldt!

Child: Well, not many rivers. Not like the Platte. They had to cross miles of desert to reach the Humboldt River. And it ran out, too.

Teacher: You've compared this river with the Platte, Susan. By looking at these pictures, maybe we could make some other comparisons with the land the pioneers have already left. (Presented a series of large paintings depicting wagon trains moving through forested regions, the high grass country, the bunch grass of the Great Plains, and the desert.)

Child: The land has really changed!

Child: Back here it was green, and lots of water.

Child: Then it starts getting dry.

Teacher: That is true, isn't it? Does that change make you wonder about anything? Here at the Mississippi there are trees and deep-flowing rivers. Further west the vegetation becomes . . .

Child: Grass!

Child: Then bunch grass in the Great Plains, and now cactus.

Child: It changes steadily!

Child: Why is that?

Teacher: You've identified a really interesting problem there, Mike. Can you ask your question more clearly, though, so we know just what you mean?

Child: Why does it become drier?

Child: I'd like to know, why does it become a desert?

Child: Not just a desert. It's the whole change, like Mike said. Why does it become drier and more like a desert?

Teacher: Where?

Child: In the Great Basin.

Child: As you go west.

Teacher: Let's write your question on the board and see which wording you prefer now.

In the following minutes the children reworked the definition of their problem-question till it read:

> "Why Did the Land Become Drier and More Desert-Like as the Pioneers Moved from the Mississippi to the Great Basin?"

By this time interest was exceedingly high and suggestions enthusiastically shared. Sample hypotheses the children formulated follow:

Child: Maybe there was all a big lake once and it dried up and that left the desert. The lake became just sand.

Child: That's a good idea! Like Great Salt Lake. It's drying up all the time.

Child: I don't think so. Because that wouldn't tell why the grass gets shorter all the way.

Child: I think it has something to do with the rivers. Back here there's lots of rivers and in the Great Basin there aren't hardly any.

Child: But that doesn't tell why it's hot here . . .

Child: Nicky, look at the problem. It's *drier,* not hot.

Child: I think it all fits together, though. If we could find out why it's dry, we'd find out about the temperature, too. It's all climate.

Child: Hey, that gives me an idea! Maybe it's the air. Maybe the air gets all bottled up and there isn't as much air here and it doesn't rain.

Child: I don't think air bottles up. But wind brings clouds and rain. Maybe the air is dry and there aren't any clouds.

Teacher: What would we need to do to test your hypothesis, Greg?

Child: We'd have to find out about the wind and if it brings rain here.

Child: There's plenty of mountains here. Maybe they have something to do with it. They could bottle up the air!

Child: You need water to make rain. Rain forms at the ocean and bursts here (pointing to the mountains) and there's no rain here (Great Basin).

Child: We should really find out. We just have ideas up there now.

(With teacher guidance the children now turned to science experiments to test several of their hypotheses. Since they agreed the hypotheses regarding rain to be important ones, they investigated first the sources of rain.)

> A teakettle was heated and a coldplate held over the spout. The steam further condensed and "rain" fell from the cold plate. Conclusion: Rain is part of a larger cycle, and depends on a water source, in this case the Pacific Ocean. Water vapor is condensed if the air is sufficiently cooled.
>
> Two paper bags were suspended upside down from either end of a balanced balsa wood rod. A lighted candle held beneath one bag caused it to rise and the other to fall. Conclusion: Air that is warm rises. Air carrying moisture from the Pacific can rise enough to be transported.
>
> The children then studied a topographic map of the U.S. and identified the Sierra and Rocky Mountain ranges which further forced the air upward to cooler altitudes. From these data they now hypothesized that rain should fall where the air was thus cooled.
>
> To test further this refined hypothesis, they turned now to reading material which graphically illustrated the effect of these mountains on the Prevailing Westerlies. Rising over the mountains, these winds are indeed cooled, drop their moisture there, and continue across the Great Basin as dry, desert-producing winds.

Child: We were right! The wind doesn't have enough water left to rain.

Teacher: Can someone summarize for us now the reasons this is a desert region?

Child: Well, the air gets water, I mean water *vapor,* from the Pacific Ocean and it blows eastward to the mountains here. Then it has to rise up and when it gets cool, it rains.

Child: The cold air makes the water vapor change back to water and that makes clouds and rain.

Child: Then the winds blow on, but they are dry so they don't bring rain to the desert or the Great Plains. After a while they pick up more water though, and there's more rain farther east.

Teacher: Do you suppose we've found out the reason for all desert regions?

Child: No! Just about deserts caused by mountains. Maybe there's other reasons, too.

Teacher: Thinking back to our pioneers, now, when do you suppose they will have relief from the desert condition and find more water?

Child: When they cross over the mountains.

The many questions children raise as they seek to continue their longer-range plans in social studies are illustrated by the kinds of problem questions presented here. Third graders planning to add a dry-dock to their harbor need to know how a dry-dock works. Fifth graders producing a product map of the United States investigate the geographic locale of iron deposits and slaughter houses, cotton mills and oil fields. Sixth graders constructing planes of balsa wood eagerly pursue the reasons for cambering the wing. These questions are thus more than intellectual curiosities. Once answered, they will be returned to the situations from which they arose. Answers are applied and life moves along more richly than before. Wood is obtained and the dry-dock constructed. Product symbols are selected and committees chart them appropriately on large outline maps. Balsa wings are carefully sanded to a cambered surface and cast into the air in flights which test the adequacy of the children's theories and skill. But notice: it is not the accuracy of the answer which has been tested. Rather, the answer is accepted as a known, and application of knowledge already found to be true in the adult world has been made to fit the child's own experience. In no sense, however, is question-solving a mere exercise here. The children *use* the answers and experience with question-solution the satisfaction that goal realization brings about.

Example Seven

Some problems that seem to be primarily intellectual actually have high value components. The following example not only illustrates movement toward value judgments, but also points out the necessity of clear problem definition.

A sixth grade, in a communications study, has organized a class newspaper. They have literally turned their room into a newspaper plant, creating in the various sections of the room a reporter's desk, a copy desk, the editorial staff, the printing shop (duplicator and other paraphernalia), the art department.

A broadly conceived unit of work provides opportunities for many sub-units to develop which eventually present problems for solution.

In a staff meeting, after their first publication, the class has evaluated this first issue. They have concluded that, for a first effort, it is a good job. But, they conclude, there is room for much improvement. One question that emerges is "How can we decide what items to place on the front page?"

A question emerges.

Teacher: Shall I record this on the chalkboard?

Child: I think world news should go on the front page!

Child: Well, you have to have some local news there too, because that's what people are interested in.

The children jump into the process (not necessarily in logical order!) attempting solutions immediately.

Child: They have crimes on the front page.

Child: I think the funnies should come first!

Even digressions are heard!

Others' opinions are expressed.

Arguments, differences of opinion, exchange of fact and belief.

Teacher: You seem to have different opinions about this. Do any of you know what city newspapers do?

Child: *The New York Times* doesn't feature any crimes!

Guiding the class to consider some data in addition to their own ideas.

Child: Well, The ———— ———— in our town does!
Teacher: How can we settle this?
Child: We can look in the books we have about the newspaper.
Child: We can collect different papers and analyze them.

Focusing on possible, deliberate procedure.
Proposals for data collection.

The class is then helped by the teacher to organize a strategy for data collection.

a. Various children volunteer to collect newspapers to bring to class for analysis.

Jobs are defined.

b. A library period is organized in which some groups go to the school library to search for information; others explore the books in the class unit-library.

These children have had several years' experience using many materials for social studies. They have beginning search procedures well-established.

c. A class discussion period is held where information gathered is reported to the group.

Data are presented:
(1) From books.
(2) From exhibits.

Child: Well, we have a lot of information, but it still doesn't help us.
Teacher: What do you mean, Louis?
Child: There are so many different ways it's done.
Child: Some papers, like *The New York Times,* have a very clear policy.
Child: Well, the tabloids do, too! They just use sensational stuff.
Child: We can't do that in our paper.
Child: Sure we can. We can feature the sensational win of the Ladera Tigers over the Fremont Bears! (laughter)

Sensing a problem.

Evaluating data.

Teacher: What, then, is our problem?
Child: We have to decide on a policy for our paper. What kind of a newspaper shall we be?

Focusing on problem identification.
The previous data search has contributed to the definition of a real problem.

Teacher: What do you mean, Mary?
Child: Well, shall we be sensational like the tabloids, or very proper, like *The Times?*
Child: I don't think we should be like *The Times.*
Teacher: Why not, Tom?
Child: Children aren't interested in world affairs.
Child: But they should be!

Pushing for further definition.
The problem is taking on definition.

Exploring consequences of a possible policy.

A heated discussion follows, in which the children range from immediate practical considerations to ideals about the role of newspapers in the community. The teacher guides the children to carefully define the policies they have proposed. They list their proposals and discuss them. They invite in the managing editor of the local paper to present the official policy of his paper.

Finally, after several days of deliberation, they meet again to settle their problem.

Classroom Resources for Problem Solving

There are a number of organizational arrangements and techniques that stimulate or precipitate problem-solving situations in elementary schools.

EXPERIENCE UNITS

When the social studies curriculum is designed around experience units, children engage in many ongoing enterprises within which many problems reside. Children who are reconstructing on the classroom floor a miniature community *which they will use for exploring community activities and relationships,* as in a harbor community study, are inevitably faced with planning, construction, interpersonal relationships, searching for answers to questions, and human relations problems. These problems become *real* for children because they satisfy children's need to explore and reconstruct the adult life around them in active ways. They are multisensory, not limited to intellectualizing *about* the matter in question, and involve the child as a totality. They are active explorations and involve genuine transactions with the environment. In these units, a situation (an arranged environment) is responded to by children (they use the boats in the classroom environment, and make others out of floor blocks, and run them on the floor). The interaction creates problems (collisions, need for better boats, a harbor). The problems lead children (under teacher guidance) to research, planning, and construction, which enable children to operate a more intricate harbor community (shipping cargo, feeding and housing workers and their families, etc.) and which thereby precipitates further problem-solving situations. This is an on-going process in which the teacher may set the stage, then step aside as children take hold, take their own next-steps and face or sense a problem. Then the teacher assumes a guiding role and problem solving occurs—sometimes with an individual, sometimes with a group.

Construction and Industrial Arts Activities

When children attempt to construct something—a house, a boat, a truck, a bridge, an airplane—they are faced with intellectual tasks (conceiving a boat, planning procedures), physical ones (handling materials and tools), and social ones (getting along in groups or sharing ideas and materials). These are excellent problem-situations for young children since they are multisensory. They have the fortunate feature of meeting immediate child-needs and interests at the same time that such enterprises involve children in explorations which provide them with working models of the wider world into which they are growing.

Industrial arts processes are the products of man's previous problem solving. When properly used as social studies data, they can illuminate the study of man: the problem-solver. Thus, children can be presented with physical and cultural information and asked to "invent" the means to solve problems of living in a given environment.[18]

Science Experiments and Demonstrations

A society that has developed its technology and its civilization through scientific processes can best be understood when children experience the systematic experimentation of scientific thinking in simple experiments that help them understand man's increasing control of his physical world. Thus, the children who precipitate moisture over cold air come to understand what causes rain, and, eventually, some aspects of weather-control as they reconstruct life crossing the plains and desert in the study of the Westward Movement, for example.

Group Work

Group work precipitates many interpersonal problems: how to reconcile different opinions, how to share limited materials, how to resolve leadership ambitions and roles, what to do to get good teamwork. The new social science programs, such as the work of Fox, Lippitt, and Lohman and their associates, build into the on-going group work of the classroom content on small group behavior and causal relationships. Ralph Ojeman in his work at the Iowa Child Welfare station demonstrates the use of content on human behavior as part of the social studies program.

Dramatic Play, Role-Playing, Simulations

Teachers of young children have long known that children reconstruct the world around them through dramatic play. Because the adult world of our culture does not permit actual child participation in the major life activities as is possible in primitive cultures, children are forced to get inside this world through play. In addition to providing the teacher an opportunity to check on the accuracy of children's concepts, this spontaneous form of child exploration can be used in a more organized way for social studies purposes.

In a social studies program *dramatic play* is used to encourage children to explore an area of human experience by reliving the activities and relationships involved in it. Its major purpose is to help children identify emotionally with the people, their life activities, and the time and place involved, so that they may develop *real interest* in the activities being experienced. Real *felt needs* will impel them forward to vital learnings. A major concern is to involve children in common enterprise in which they can learn to work and live together democratically and meet their own basic personality needs.

Thus, children playing pioneers, or firemen, have a chance to enjoy the feeling of being firemen or trappers or Indian Scouts or bullwhackers; and, at the same time, they develop a need for information and gain understanding of the data they gather as they use them in the play.

Children studying pioneer life may choose to portray, in dramatic play, many situations that arise as a wagon train moves westward out of Independence. The boys and girls elect a wagon train captain, divide into families, and dramatize a day on the trail. The events are unspecified. Each child decides for himself what he will do and the kind of a man, woman, or child he will be, within the general framework of the wagon-train setup agreed upon. As the play progresses, the action of the individual players will precipitate events. Continuity emerges from the spontaneously expressed ideas of the players.

The teacher's primary objective is to guide the evaluation of the play in such a manner that children will feel the need for more accurate and detailed information so that they can better identify with the time and people as they resolve the problems that emerge through the play.

In the use of this technique both question-solving and problem-solving situations develop and permit experience with a wide range of problems. It is a process where the children's own activities precipitate problems, and the proposed solutions can be tested out in further play or in actual experiences with processes.

ROLE-PLAYING OR SOCIODRAMA

A technique closely related to dramatic play is role-playing or sociodrama. This is primarily a group problem-solving tool, focused on human relations content. Usually in a sociodrama session, a problem is presented by the teacher or it emerges from the group. Solutions are proposed by various members of the class in the form of spontaneous enactments of the situation. The class serve as active observers of the actors, evaluating and criticizing the playing of the roles, offering other enactments, and continuing discussion until a variety of possible solutions and their consequences have been explored. The enactments are focused on exploring alternative solutions and their consequences.

Dramatic play is often relatively unstructured, with a main purpose of reliving the activities of a group in which the total class is involved. Role-playing is structured as a definite situation involving a problem of inter-personal or intergroup relations with most of the class as audience or observers.

Let us use a Westward Movement study to further demonstrate the difference. The teacher may deliberately present the following situation to the class as a simulation or it may have arisen in the dramatic play.

A wagon breaks down, because it is overloaded, while the train is moving through a narrow pass, and is endangered by Indians or by a snow storm. The wagon captain orders a halt so that the damaged vehicle may be repaired. Members object. The whole party may be snowbound here in this narrow, inhospitable pass if the train is held up in order to repair a wagon that would not have stalled if the driver had just used ordinary common sense in loading. The captain insists that all must stick together. Protests arise, argument grows heated. Finally one man refuses to comply with the captain's decision, and declares that he will pull his wagon out of the long line and crowd his way past the file of wagons in order to escape from the dangerous pass.

This foolhardy attempt may cause a jam in the pass that will delay the entire wagon train for even a longer period and needlessly add to everyone's peril.

The class discusses the problem briefly, defining the problem; and the various roles are described. Some children volunteer to play the parts; the rest of the class act as critical observers as the situation is enacted.

After the first players have offered their *unrehearsed* enactment, the class discusses the presentation and evaluates it in terms of: *Could it have happened this way? Why did the characters behave as they did? Is another solution possible?*

Perhaps a child playing the wagon train master decides to abandon the disabled wagon. This solution will be discussed by the class. What will be the consequences of this act? Is it practical? Could it have happened? How will the people affected feel about this? Is there another solution possible?

Another youngster may suggest a different action. She will be invited to enact her proposal. Who will she need to help her? Where does this action take place?

The first actors are replaced by the new ones who have different ideas of how the roles should be played. Again the enactment is evaluated; and still a third group of actors play out their version of the conflict, and for a third time the solution is analyzed and modifications suggested. The enactments are often brief; half a dozen different versions of the problem-solution may be played out in one session.

The focus of the group, under teacher guidance, is on the human relations and transactional elements involved in the crises faced by the wagon train as it makes its hazardous trip westward, and the consequences of the actions of people. The class may eventually generalize on the need for cooperative attitudes and skills in life.

In such a sociodrama session the emphasis is on exploring why the people behaved as they did, and on trying out many possible solutions to the problem-situation. *The session is deliberately structured for experience in specific problem solving in intergroup or intragroup relations,* in this instance in an historical setting.

Increasingly, we are seeing social studies games[19] introduced into the curriculum as a more structured form of dramatic play, or, actually, simulations, in which detailed data are provided, then children take on the roles of the people and culture under study, in order to participate *actively* in their life situations and confront the daily problems of the culture. Such enterprises have imbedded in them problem-situations that not only dramatically delineate key content, but also provide continual opportunity for practice in the processes of problem solving.[20]

SELECTION OF CONTENT

In our social studies curriculum we not only want children to know the realities of man's industries and social arrangements, we are deeply concerned with each individual's attitudes toward his fellow-man—his concern for the general welfare, his ability to identify with others, and also his understanding of and skills in human relations. There are two rich resources for content appropriate to problem solving—the developmental needs of childhood and societal problems.

The first major source of problems content lies in the broad developmental needs of children as they face the tasks that are a product of their biological development and the expectations of their culture.

Problems exist, enmeshed in the life-web of children, but which they do not easily sense or identify. Thus a young child is unhappy but does not recognize that he has the problem of shifting roles from being "the baby" in the family to becoming "big brother." He needs to be helped to face the problem and his feelings and learn other satisfying relationships, *with the emotional support of the other children.*

Children rebel against adult edicts—"You can't buy another toy at the supermarket," for example—not understanding the problems of making a budget meet all the needs and desires of the family. Or, a child striving to keep up with the peer group "cuts corners" (he keeps money when he is overpaid for a delivery) because he only vaguely comprehends the social and personal consequences of the solution he has chosen to his problem.

These problems exist and are ready materials for the social studies curriculum. The classroom teacher planning units of study on family and neighborhood life and on the community can incorporate into her plans stories about these persistent life-situations,[21] role-playing of problem-situations,[22] picture charts that invite discussion and films on interpersonal relations, and can use techniques such as are suggested by Hilda Taba and her associates in *Diagnosing Human Relations Needs.*[23] By using such an approach to unit content, the teacher is helping children to an increasing capacity to cope with problems in their own life space and is developing a bridge from the immediate problems of childhood to the wider problems of society. Ralph Ojeman has reminded us that:

> Through the social studies an effort is made to help the child understand and appreciate the social component of his culture. This culture has been in the making a long time, and the child cannot feel the significance of a current "social issue" or "social problem" unless he appreciates how the problem affects people like himself or those in whom he is interested.[24]

The school, by careful selection of the content of problem solving which provides opportunity for children to explore their own personal-social problems, *with the support and opposition of age-mates,* can help children to learn to face and accept personal-social realities and to identify sympathetically with the people around them. It would be unreal to assume that we can build generalized attitudes of friendliness to others and concern for their life-situations in a child if he himself has serious problems of personal-social adjustment in his own life-situations.

Young people can be helped to understand that their individual problems are part of larger social situations, that these relate to many of society's problems.

IMPLICATIONS OF SOCIETAL PROBLEMS FOR UNITS AND TOPICS

The elementary school child has not yet developed the conceptual ability to become deeply involved in generalized social problems such as "How shall we solve the air pollution problem of our city?". He needs to start with his own problems and gradually link them to the problems of society as he gains the experience that makes such linkage possible.

However, we can, by thoughtful selection of our social studies topics and units, select those topics and unit emphases that build on growing awareness that one's personal problems are a part of the larger problems of society. With such an orientation we would select topics that can eventually be focused on areas representative of *man's physical and human resources,* and how we use and abuse them; on *culture,* what it means to grow up in a culture—our own cultures and in the many sub-cultures in which we live, and increasingly, on other cultures, with the accompanying problem of cross-cultural understanding. We need to introduce young children to the role of science in society and help them to begin to understand the impact of technology on the environment. Today, the mounting concern for man and the environment opens up exciting and crucial problems on the local and world scene. Such areas of study offer us opportunities to design the teaching-learning situation so that, in addition to their own direct life-experiences, children can gradually explore the broad critical problems of mankind and become increasingly involved in their solution.

This means that we engage in community studies oriented around such topics as "When fathers lose their jobs" which lead to a beginning understanding of the displacement of men by automation, or of community redevelopment, pollution and conservation, *with a continual and persistent focus on people,* why they behave the way they do, what they need and what human values guide and shape a humane society. Within such a matrix, if the exploration is teacher-pupil planned and involves enterprises that permit children their own active inquiry through many media, problem-solving situations emerge in the on-going activities at the same time that the social problems of men are explored in the content appropriate to the study.

In brief, the social studies teacher needs to carefully evaluate the design of his or her social studies program in terms of its contribution to helping children to become problem-solving oriented through participation in the solution of the critical problems of our times. If we start with problems as children themselves experience them in their own life space, we can expand to the wider areas of society, using historical and comparative processes to give children depth of understanding.

The elementary school teacher, obviously, is not only concerned with the problem-solving process but with an array of significant content, media, and techniques that are appropriate avenues to this process with young children. The teacher must be highly sensitive to the readiness of children for the various facets and levels of problem solving.

A Need for Experimentation

We are agreed that teachers of young children have generalized from their observations of early and middle childhood that problems are most real for children when they emerge from the interactions of children with their environment, both immediate and vicarious, rather than from solely abstract approaches. Thus the sixth grade in our example, who tried to resolve the question of "What should go on the front page of our newspaper?", was eventually guided to the consideration of the broad social problem of responsible policies for mass media. Such problems *emerge* for examination from the concepts and generalizations the children develop through their explorations. *They are not questions with which to start a study with relatively inexperienced children!*

However, there is a need to re-examine and modify this assumption in the light of the expanding contacts children have with world conditions through mass media. How much knowledge do children have of ideological conflicts? How much do they understand of the new nationalism of developing countries? What do they get out of news of labor negotiations? Does world tension create a sense of urgency which makes problems of peace and war real to upper-elementary-age youngsters? Does the contemporary outlook of youth change the identity problems and perspectives of young children? When children verbalize about current happenings, what do they really understand? To what extent do individual differences in the ability to handle symbolic material influence the nature of the meanings children develop?

While we may rightly conclude that extensive exploration of these problems belongs at the secondary school level, we need to probe the possibilities of introducing them to children through current events and in studies appropriately related to the developmental abilities of children growing up in an age of mass media and community crises. Some elementary teachers have had stirring responses from fifth and sixth grade youngsters to ideas presented to them by local authorities on pollution, conservation, and urban redevelopment. We need to study continually the conceptual, attitudinal, and value development of children in relation to their ability to define and explore such problems of a society that questions its own survival potential.

Meanwhile, those of us who work with elementary children affirm our present conviction that problems which will be richly productive of these highly desirable outcomes must first be real and meaningful to the child as a person. This means emotional, social, and physical involvement as well as intellectual. In reality, minds cannot be separated from personality. Only as a child can get inside experience and feel in full measure the need to reorient his behavior, will a problem become his own. Experiences which are truly problematic must, by their very nature, be those which block progress for the child and frustrate the continuum of a line of thought or action he already has under way. They must arise from the content of his meaningful experiences.

This chapter has been concerned with the development of problem-solving ability in elementary school children, with focus on the contributions of the social studies program. It has been our assumption that problem solving is not merely a systematic process that can be taught effectively as a set of skills or sequential steps. *Problem solving is learned through participation in solving meaningful problems.* Nor is it sufficient to allow problem solution without simultaneously developing in children increasing awareness and comprehension of the value choices involved and the skills they are acquiring. Teachers need to strive toward uniting the idea of problem solving with effective action. This demands skilled teachers with a problems approach to life and to curriculum experiences they plan for children. Not only do teachers become problem-solving models with whom children can identify, but they provide the opportunities for youngsters to meet and cope intelligently with vital decision-making situations. Learning to do so with intelligent and reasoned examination of the alternatives open to them is among the most important opportunities elementary schools can provide.

FOOTNOTES

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[7] McDonald, Frederick J. *Educational Psychology.* San Francisco: Wadsworth Publishing Company, 1959, p. 345.

[8] Thorndike, R. L. *Op. cit.,* p. 193.

[9] *Ibid.,* p. 196.

[10] Readers interested in exploring further children's cognitive learnings through inquiry approaches might consult: Crabtree, Charlotte. "Social Studies: Field in Transition." *California Journal for Instructional Improvement,* 8:3-14, May, 1965. Crabtree, Charlotte. "Inquiry Approaches to Learning Concepts and Generalizations." (In press) Taba, Hilda; Levine, Samuel; and Elzey, Freeman. *Thinking in Elementary School Children.* San Francisco State College, USOE Cooperative Research Project No. 1574, 1964.

[11] Lee, J. M. and Lee, D. M. *The Child and His Development.* New York: Appleton-Century-Crofts, 1958, pp. 420-421.

[12] Axline, Virginia. *Play Therapy.* Boston: Houghton Mifflin. 1947.

[13] Mrs. Joy Heimbeck, teacher, Palo Alto Unified Schools, Palo Alto, California.

[14] To bring this example really up-to-date, the teacher could now use accounts of new laws on oil-spill pollution and the uses and problems of detergents. Thus young children can be introduced to the idea of pollution control and its problems.

[15] Fox, Robert S.; Lippitt, Ronald; Lohman, John E. *Teaching of Social Science in the Elementary School,* Coop. Research Project E-011, U.S.O.E., June 1964.

[16] *Ibid.*

[17] *Paper Drive.* From Shaftel, Fannie R. and Shaftel, George. *Role-Playing for Social Values: Decision Making in the Social Studies.* Englewood Cliffs, New Jersey: Prentice-Hall, 1967, pp. 212-215.

[18] See The Game of Seal Hunting in *Games for Learning* by Clark C. Abt. Occasional Paper No. U. The Social Studies Curriculum Program, Educational Services Inc.

[19] Abt, Clark C. *Games for Learning,* Educational Services, Inc.

[20] Dobbs, Dennis; Goodell, Carol; and Hill, Bob. *Hey, Can I Play? An Approach to Learning Through Simulation Games.* Menlo Park, Calif.: Portola Institute, 1969.

[21] Crosby, Muriel. *Reading Ladders for Human Relations,* 5th edition. American Council on Education. Washington, D. C. 1963.

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[23] Taba, Hilda and staff, *Diagnosing Human Relations Needs.* American Council on Education. Washington, D. C., 1951.

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Chapter 3

The Junior High and the Problems Approach

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In James A. Michener's short story, "Who Is Virgil T. Fry?", a young social studies teacher describes his first teaching position in a small Indiana hamlet. His predecessor was the ubiquitous Mr. Fry, who is described variously in the story. To his students Fry was "interesting," "the only real teacher we ever had," and a "master." To the townsfolk and to his fellow teachers he was a "terrible person," and an "incompetent." Because the latter opinions were held by adult power figures, Fry had been fired; and most adults rejoiced at the removal of a gadfly and a malcontent from their midst.

The narrator, however, finds that while Mr. Fry may be absent physically, traces of his personality and his efforts remain. The young teacher struggles to organize and present his material in an exciting fashion, but his classes are dominated by yawns, apathy, and a wistful hope that Mr. Fry might return. In desperation the struggling neophyte decides to ape Mr. Fry's techniques.

> " 'Tom,' I asked, 'will you take over?' for I had no idea what Mr. Fry's method was.
>
> Tom nodded vigorously and came to the front of the room.
>
> 'All right,' he rasped, 'who will dare?'
>
> 'I will,' said a girl. 'I believe that Columbus came to the New World more for religious reasons than for commercial reasons.'
>
> 'Oh!' groaned a group of pupils snapping their fingers for attention. Tom called on one.
>
> 'I think that's very stupid reasoning, Lucille. Spain was only using religion as a mask for imperialism.'
>
> Lucille turned in her seat and shot back, 'You wouldn't think so if you knew anything about Philip the Second.'
>
> And the debate continued until Tom issued his next dare. A pupil accepted and defiantly announced: 'I think all that section about Spain's being so poor at colonizing is the malarkey. Everything south of Texas except Brazil is now Spanish. That looks pretty good to me.'
>
> I winced at the word 'malarkey' and the pupils winced at the idea. The tigers of Anglo-Saxony rose to the defense of the text and the challenging pupil did his best to stand them off."[1]

Michener's story, of course, deals broadly with the limits of what our society will tolerate from teachers rather than with specific techniques of instruction. But the story does raise significant questions for social studies teachers. While they would not wish to suffer Mr. Fry's fate, social studies teachers might envy his ability (in fiction at least) to teach students to form opinions, to take issue with one another, and, above all, to get them intimately and personally involved with significant content from the social sciences.

How may these ends be accomplished? Are they the products of a teacher's knowledge or of his skill of presentation? Are they the functions of personality so that only certain types of teachers may achieve them? What techniques, methods, and organizations stand the greatest chance of eliciting these kinds of student behaviors? Unfortunately, no easy answers are available. A fundamental assertion of this chapter, however, is that the teacher of junior high social studies may find the problems approach valuable in his search for answers to these questions.

The junior high school social studies teacher often reacts negatively to the suggestion that the problems approach has anything of value to say to him. Beleaguered by large classes, burdened with an impossible teaching load, facing a seemingly chaotic array of abilities among his students, and at times, restricted by community attitudes toward education, the teacher is likely to feel that any attempt to get him to use aspects of the problems approach is actually harassment. The problems approach, because it is relatively "new" and "different," would tend to strip away what little comfort and security he possesses.

Aside from the teacher's overworked and insecure state, there are several more substantial reasons for his reluctance. The first is the difficulty of defining the problems approach in a meaningful way. Despite the attempts of many commentators from Pestalozzi through Dewey to Hullfish and Smith at defining the approach conclusively, the concept still is often shrouded with a mystique that makes it difficult to understand, let alone to apply in a classroom situation.

Definitions have at times been overly simple. For example, David Riesman's contention that social studies content be handled with "vigor and candor"[2] is a stirring injunction and seems to suggest a problems approach. It is, however, neither incisive nor precise. Conversely, some definitions of the problems approach have identified with it all that is good, true, and beautiful in teaching. These attempts to define good teaching and the problems approach synonymously do not provide much help for the teacher.

Fortunately, this difficulty is not insurmountable. Elsewhere in this Bulletin, Metcalf defines the problems approach in such a way as to avoid both extremes and yet to be precise enough to permit translation of the problems approach into classroom activities. His definition of problem-solving as "perplexity" makes the problems approach a process of seeking ways to arouse perplexity and increases, it would appear, the possibilities of classroom use.

A second difficulty that may overwhelm the junior high teacher is the common assumption that the problems approach must be concerned with contemporary problems upon which his students must reflect and ultimately act. Since the teacher can see few problems which are both contemporary and upon which early adolescents may act in a significant manner (aside from such possibilities as "the problem of caring for pets" or "the problem of a balanced diet for teenagers"), he is likely to throw out the problems approach summarily.

Emphasizing that a "problem" is, in part at least, a psychological phenomenon (i.e., something with which students become involved and interested) helps to obviate this difficulty. It suggests that contemporary problems may be likely to arouse student interest, but contemporaneity is by no means a necessity. Similarly, it is unnecessary to link the problems approach to potential action which of course limits the kind and the scope of the "problem" to be studied. Viewed as "perplexities," problems may be studied and "solved" in many different subject contexts.

The junior high teacher often has a further difficulty. The problems approach may have been presented to him as a panacea. Well-meaning advocates, imbued with all the messianic spirit they can muster, may present a picture of the problems approach as the one method which will solve all teaching headaches. The naive or unsuspecting teacher may try a set of techniques recommended and find that the desired outcomes do not result.[3] Such an experience leads to disenchantment, and the pervasive "I tried it, but it didn't work" attitude. Thus, the teacher constructs a wonderful defense mechanism by placing the onus of failure upon the method or the organization rather than upon the application and use of the approach. A realization by the teacher that success is not an automatic outcome of the problems approach will enable him to set far more reasonable expectations.

A final difficulty involves the time-worn educational clichés concerning readiness. Despite the soundness of the case for problem-solving techniques wherever school is kept, the junior high school teacher may still be bothered by the haunting refrains of "they must get the facts first" and then problem-solve. By a process of easy translation, this statement comes to mean that the early teen-age years must be spent in an orgy of fact-gathering in order that students might be "prepared" for high school.

This frame of mind is undoubtedly related to teachers' misconceptions of what the problems approach is and how it can be used in the classroom. A more sophisticated appreciation of the philosophy and psychology of the problems approach (presented elsewhere in this Bulletin) will serve to overcome this difficulty.

The author of this chapter feels that these difficulties, while understandable, should not obscure the values of the problems approach. Most certainly, they should not prevent the junior high social studies teacher from giving serious consideration to using the approach in his classes.

Definitions

Since the problems approach is an ambiguous and difficult concept for many junior high teachers, some attempt at defining terms the way they will be used in this chapter is necessary. The theory, philosophy, and psychology of problems is dealt with in Chapter One, and readers should refer there for a complete discussion. What is needed here is a brief operational definition of the approach and a set of criteria on which the problems approach in the junior high school may be judged.

The problems approach is viewed here both as a *method* (or a set of techniques) of teaching and as a way of *organizing* a course or unit. Drawing distinctions between these definitions may not always be necessary, but they may be helpful in doing away with confusion and in putting the problems approach to work.

In terms of this chapter, problem-solving as a method or set of techniques is closely related to the concept of reflective thought as discussed and defined by Griffin, Metcalf, and Hullfish and Smith.[4] It involves helping students learn in a significant way whatever content is placed before them. One major aim of the method is to stimulate the student to react to the material being taught. The student is to react in various ways. He may be placed in a situation where he is forced to discover relationships between and among social phenomena. He may be involved in a controversy over a personal or social issue. Or he may find what he previously knew to be true challenged by new knowledge or contention. In short, he is placed in a problem situation when he becomes perplexed, regardless of the context of his perplexity. Another major aim of the problems approach is to provide the student with a way of resolving his problem. This does not necessarily entail an "answer" to the question, or a "definitive solution" to the problem, but rather a way of accumulating reliable information, forming reasonable hypotheses, and developing rational attacks upon the problem.

The task of the teacher using the problems approach is to find ways and means of arousing a perplexing situation and of involving students with the content. The basic assumptions of the problems approach as method are that: (1) teaching in social studies must emphasize "thinking goals"; especially those with divergent qualities. (2) other methods are less conducive to the development of these goals; and (3) such teaching can be induced in the typical classroom in connection with a wide variety of content.

The problems approach seen as a way of organizing a course or a unit is essentially a mode of facilitating a class' entry to "perplexity." That is, the teacher or the teacher and the students together structure a course or a topic around a problem or a problem situation. The topics studied may be broad social problems which confront people in the nation or the world (i.e., problems of securing and maintaining economic security, the problem of maintaining peace, and so on), or they may be problems which are close in time, space, or interest to the class. The emphasis in such an organization is continually pointed toward possible solutions to the problem. This does not mean, of course, that students can begin to solve either societal or individual problems in any final way. But the students can begin to see the complexities of human problems and several alternative solutions to them. They also can become acquainted with an appropriate scientific method of attack upon problems in general.

The most obvious examples of the problems approach as a mode of organizing a course are the problems of democracy class usually taught at the twelfth grade level and the courses in both junior and senior high schools organized under the "core," "fused," or "block time" labels. Some observers maintain that the problems organization is more appropriate if the problems studied are related to the immediate concerns of youth or to social problems which affect young people. While this contention has a logical basis, teaching "problems" units or topics in a course organized along "subject" lines is completely feasible. The possibilities of problems organization in American history, government, and geography classes, are, in fact, much greater than ordinarily assumed.

The problems approach, then, may be viewed both as a method or as a set of instructional techniques and as an organizing principle which attempts to put students in situations to which they must react to "solve" a type of problem.

Criteria for Judging Problems Situations

Before describing classroom illustrations of the problems approach in action, it is necessary to discuss briefly three criteria which may be helpful in judging the quality of problems situations. This discussion is premised on the notion that the problems approach has certain identifiable characteristics—that "just any old situation will not do." The writer feels that a good problem solving situation has at least the following characteristics.

First, the problem must be a real one to students. That statement is one of the most common clichés in educational jargon, and finding a "real" problem has provided many teachers with a true personal problem situation. The typical answer to the question, "What is real?", is in terms of what is of most immediate concern to students. Thus, a class of twelve-year-olds should identify as most real, problems like avoiding skin blemishes, getting along with siblings, and other similar kinds of personal anxieties. Such problems may at times be appropriate for social studies classrooms, but by no means do they constitute the only kinds of real problems to young people. Rather, a real problem situation occurs when a class is confronted with something which they do not know and are stimulated to study and learn it. The substance of the problem is largely, if not totally, irrelevant to the question of realness; the state of the learner is most significant. The student who wants to know why the Amazon Valley does not support a large population has a real problem, quite possibly as significant to him as are his worries over his complexion.

Second, the learning necessary to solve the problem should be specified by the teacher. What is the point of confronting the class with this problem? How should students behave after considering the question? The teacher of the student whose problem is "Why is Amazonia seemingly underpopulated?" might specify that the student will become acquainted with the rainfall, soil, and vegetation patterns of the area, that he will consult appropriate references including the opinions of experts, and that he will come to an explanation which is related to the evidence. In situations where there are no "right" or "wrong" answers, the teachers might expect that a student will base his opinion upon apparent facts and respect the viewpoints and opinions of his peers. Careful specification of goals avoids the possibility of long-winded, directionless, and uninformed debate.

Third, the problem should be one that is socially significant; that is, one which falls truly in the domain of the social studies, either because it is related to a major problem of society or because it concerns significant data from the social sciences.

Not all problem situations that junior high teachers use will meet these criteria. This writer maintains, however, that consideration of such elements will enhance the efficacy and contribution of the problems approach.

Strengths and Weaknesses of the Problems Approach in the Junior High School

The preceding argument for the use of problem solving in junior high school is not meant to imply that the approach is fool-proof and destined for success. Rather, this author feels that problem-solving, both as a method and as a way of organizing content, has certain strengths and weaknesses. A discussion of these strong and weak features is necessary before specific situations and illustrations are discussed.

A fundamental advantage of the problem-solving approach is in its relationship to the most significant goals of social studies instruction. Recent commentary concerning the *raison d'être* for social studies instruction has emphasized the primacy of "thinking" goals. These arguments hold that the social science disciplines from which the content of social studies is drawn contain a fantastic quantity of knowledge. Social studies instruction cannot be improved by a simple process of accretion or reduction—adding names to be memorized or jamming a course into a semester rather than a year. The road to improvement lies in the direction of encouraging processes of thought (as Hullfish and Smith say, the development of "controlled thought").[5] The problems approach applied to social studies holds this as a central objective. Both the content and the method of the problems approach aid in the achievement of this educational objective. By placing young people in contact with *real* problems or by creating meaningful involvement with significant content, young people can make progress toward this goal.

A second significant strength of the problems approach is that its use is more likely to induce intelligent and informed action toward the solution of personal and social problems. Again, most recent commentaries emphasize the desirability of close relationship between social studies instruction and action of a problem-solving nature. In fact, the bulk of opinion seems to hold that the best mode of evaluating social studies instruction is the degree to which students are made aware of and become actively engaged in social problems. Everyone, thus, desires not only the thinking man but also the thinking man who will act. How can such a person be produced without a determined effort in that direction? Certainly not all problem-solving techniques suitable for junior high school lead to intelligent action. But the problem-solving approach may often lead to an awareness of "problems" both social and individual and, moreover, may stimulate the desire for group or individual action. While the desire to grapple with social problems is not enough in and of itself, it is at least a step in the right direction.

A third strength of the problems approach in junior high school is contained in the emphasis placed upon a wide variety of instructional materials. Proponents of other methods or modes of organization also recommend that students come into contact with many types of materials, but variety in resources is indigenous and essential to problem solving. A teacher can hardly hope to apply problem-solving techniques through the use of a single textbook or any one source. Nor can he adequately use problem-solving techniques if he follows slavishly the dictates of a predetermined course of study. These comments do not deny the need for books or printed guides, but they do point up the need for the examination of points of view by students and the willingness by teachers to depart from a "canned" outline when a class appears to be perplexed or when a difference of opinion arises.

A further advantage of the problems approach is that it is likely to reduce the need for the many none-too-subtle ways of motivating students to learn. One of the real dangers in the current "revolution" in education is that students learn only for high scores on tests or to achieve other unrealistic learning goals. Indeed, the quest for grades seems to dominate the school lives of many teen-agers, and the spectre of grade-seeking has crept downward into the junior high school as well. Since problem solving stresses the meaningfulness of the learning situation and the involvement of the pupil with significant problems, there is less likelihood that rewards and punishments in the form of grades need be emphasized.

Finally, the problems approach has the advantage of being more likely to transmit truly democratic values and attitudes than other techniques and organizations. Implicit in the problem-solving approach is the necessity to examine questions and issues in a reflective fashion. The student is under the constant injunction to form tentative hypotheses, to come to his own conclusions, and to seek consensus where possible, but to allow for differences of opinion where agreement cannot be reached. It is paradoxical to talk about the development of critical judgments and logical thinking but never to put pupils in a position where real judgment and logical thinking may result. Problem solving demands that students "inject" themselves into the problems of the culture at one level or another. They are forced by the nature of problem solving to test the validity of the facts accumulated in school and to use these facts to make up their minds. Through steady use of problem-solving techniques the student is more apt to internalize certain basic democratic values.

Several other advantages of the problem-solving approach with junior high students could be listed. Observers have mentioned the close relationship of problem solving to the fused, block, or core organizations which often dominate junior high school social studies programs. Others would stress the potential growth and development of self-direction on the part of individuals taught by problem-solving techniques. Space does not permit further elaboration of these and other advantages. It is apparent that the above arguments constitute sufficient strength to warrant a further look.

Although the rationale for the problems approach is sufficiently strong to suggest its use, careful analysis has revealed several significant weaknesses and limitations in its use at the junior high level. Whether these weaknesses are due to inherent logical and structural difficulties in the approach or to inappropriate application of its techniques and principles is a moot point, but one which is irrelevant in the present discussion. What is relevant is that teachers recognize these weaknesses and realize that use of the problems approach affords no automatic or guaranteed success.

When the problems approach is viewed as a way of organizing material for presentation to a class, it provides no indication of how the various levels or courses in a social studies curriculum relate to one another. For example, the seventh grade teacher who finds his class greatly interested in a study of racial tensions in the United States may formulate several problems for them to investigate (i.e., What are the effects of racial intolerance upon the individual? What are the responsibilities of each individual to secure equal rights for every American?). His class may find the investigation of the problem very profitable, but, in deciding to study this problem the teacher may have undercut the ninth grade teacher who will have the same students and whose curriculum guide calls for a study in depth of racial tension.

Teachers must also realize that the problems approach does not provide a license to investigate any and all problems without regard for the maturation of their students. Junior high pupils are obviously limited in experimental background and incapable of coming to grips with many sophisticated social and intellectual problems. One teacher, for example, tried to set a problem for his junior high American history class by explaining Beard's economic interpretation of the American Constitution and then asking his twelve-year-old students to criticize the underlying assumptions! Such inappropriate use of problem solving will defeat the purpose.

Another weakness of the problems approach lies in the possibility that pupils may come to facile and naive solutions to complex social and personal problems. The junior high student may not see the myriad difficulties inherent in even the relatively simple problems that affect his own life or that of his community. The net effect of over-simplified solutions may well be a cynical attitude toward society as a whole and toward those officials who work to solve problems in a real setting. Unless students realize that they study problems to understand and not necessarily to solve them and to develop and perfect skills rather than to put the final polish on them, they may be disappointed in the approach.

The use of the problems approach is more time-consuming than other techniques and organizations, and this is frequently mentioned as a weakness. It is infinitely quicker to "give" background information than to put pupils in the position of finding it themselves. Also, it is far less expensive of time to present many-sided issues to a class than to allow pupils to discover them in class discussion or debate. Faced with the demands of following a curriculum guide, the teacher at times may wish to use other methods and organizations than problem solving.

A final weakness of the problems approach involves what we do not know about the learning process. While logical analysis of learning and thinking and the results of some research studies support the use of the problems approach, learning psychologists are not yet in complete agreement about the way in which people learn. Furthermore, it is possible that the problems approach is less effective with some groups of students than others. Abstract mental processes involving an intellectual attack upon a problem may be impossible for less able students to use.

Thus, several distinct weaknesses or disadvantages to the use of the problems approach can be identified. This author feels that the strengths overshadow the weaknesses. Teachers should, however, avoid a tendency to handle all classwork through problems techniques. Rather, the approach should be handled with restraint and caution, keeping in mind that student behavior should be tested frequently and adjustments made in accordance with the results. As Hullfish and Smith have indicated: "Too frequently the suggestion that the development of thinking . . . be made the focus of the educational effort has been taken to mean that problem solving should stride to the center of the educational stage and banish all other aspects of class activity to the wings. . . . It is not to be expected . . . that each student at each moment will be solving a problem, nor that a class, as a class, will be doing so."[6]

Illustrations of the Problems Approach in Junior High Social Studies[7]

The balance of this chapter is devoted to illustrations and examples of how the problems approach can be put to use. An attempt has been made to provide a set of illustrations balanced among the typical course offerings in junior high social studies rather than to concentrate on or emphasize illustrations in a particular kind of course. The classroom illustrations were drawn from a number of sources; in the main, they represent situations and techniques which have withstood classroom testing.

The format of the presentation differs greatly because of the nature of the material or the illustration. At times the situation is dealt with in purely descriptive terms. In other cases an attempt is made to convey through transcriptions, study guides, and the like, a sense of what actually happened in the classroom. Since most teachers experience difficulty in establishing a problem in their classes, more attention is devoted to initiating the problems situation than to describing the outcome. Each illustration is followed by a brief commentary and evaluation.

THE PROBLEMS APPROACH IN AMERICAN HISTORY

The typical junior high student will probably spend at least one year in the study of American history. While local and state variations make the courses widely different in periods or data studied, all courses in history present unique and frequent opportunities for the use of problem-solving techniques. The cases described here demonstrate a variety of approaches to the use of problems techniques.

Illustration A. A group of teachers and social studies specialists centered at the University of Minnesota developed a series of case studies designed for use in junior high history classes. The cases had two general objectives: (1) to teach some rudimentary aspects of historical method; and (2) to place students in positions where they must act as the historian does when he examines data.

Historical method has been long associated with the teaching of history in general. In fact, historians have issued a constant remonstrance to history teachers that the teaching of method as part of the content of history is completely appropriate. Undoubtedly, many teachers have attempted such teaching either incidentally or as a part of their planned class activities. Usually, such attempts consist of assigned readings from typical "source" books in history.

The program described here differs from conventional attempts in two important respects. Since junior high students could hardly be expected to "start at the top" and without prior training begin to behave as the historian does, an attempt was made to identify and to teach separately and sequentially the various elements of the historical method. That is, the easiest and most basic elements were introduced first. The more difficult and sophisticated elements were taught later and in a more difficult historical context (i.e., the slavery controversy). Also, each lesson was structured so as to pose one or several "problems" which each student had to solve. These problems placed the student in a position where he had to deal with an open-ended situation, a question which had no completely "right" or "wrong" answer. He was forced to come to a decision on the basis of the information presented to him.

Thus, each lesson was a problem situation or a series of problem situations for the student. These situations were not contrived, but were instead closely analogous to the way the historian works when he attempts to interpret a past event.

The first three lessons in the series dealt essentially with the records of the historian, his raw material, the things with which he works and from which he must write history. Students were also asked to solve simple problems which involve historical records and the difficulty of proof. The first and simplest of such problems is as follows.

"Suppose some wealthy man asked the following questions about you and offered to give you one hundred dollars if you could prove your answers correct. What records from the past could you use to win the money? How could you prove your answers?

a. How much did you weigh when you were born?

b. Where did your family live when you were born?

c. How tall were you on your seventh birthday?
d. In what year was your mother's mother born?
e. How many days of school did you miss during second grade?

If your 'proof' for any question is just the statement 'My mother (or father or Uncle Charlie) says so,' the rich man will not pay you. Why not? What's wrong with 'proof' that's based on the statement of one person?"

Several subsequent lessons ask students to deal with historical events which have been variously described and interpreted. In these lessons, the students become acquainted with the historian's problem of biased original and secondary accounts, the reliability of witnesses, and the general problems of interpretation in history. It is important to emphasize that students are not merely presented with the method of the historian, but are continually put in positions where they must solve problems as an historian.

A specific reference to the effects of the approach may better illustrate the type of discussion which occurred in class. In the final lesson, the students investigate several questions pertaining to slavery and the Civil War. The original intent of the writing group was to structure the lesson around the question "Was slavery the cause of the Civil War?". Appropriately enough, the entire focus of the lesson was altered when a "problem" arose in one class using the material prepared for the original question. One perceptive student asked, "How can we tell (whether slavery was the main cause of the Civil War) when we don't know what slavery was like? I'd like to know." The other members of the class agreed, and the teacher's plans had to be altered. The approach and the progress of the class in attacking their problem will provide insight into how the process worked.

The teacher's first question was, "Where do we go to find out? Who would know?" The almost unanimous class response was that the slaves would know if anyone would. When pushed for other sources, they named slave owners and northern abolitionists. One enlightened soul suggested that all these sources carry a built-in bias. Weren't there some foreigners or men from Mars who did not care one way or another and who could give an honest opinion? The class delegated the teacher to collect appropriate sources and to report back to class.

As a result of one pupil's question, then, the class read excerpts from Booker T. Washington's *Up from Slavery,* Botkin's *Lay My Burden Down,* Fanny Kemble's *Journal of a Residence on a Georgia Plantation,* Weld's *Slavery as It Is,* and several other books, some of which dealt with what European travelers said about slavery from their observations.

In order to convey an impression of how the class reacted to discussions of these excerpts, a transcription of class discussion is presented below. Because of space limitations, the discussion has been edited so as to convey the general orientation and direction taken by the group.

Teacher: From what you read in Washington's autobiography, what in general was his opinion of slavery?

Student A: Things were pretty bad; slaves didn't have much of anything.

Student B: He hated it; he was always getting flogged and beaten and he never got an education.

Student C: How could you say he hated it? He says his owners weren't cruel. Besides his parents were the ones who beat him.

Student A: Even so, there were lots of things that were real bad. How would you like to eat like pigs at a trough and wear those itchy flax shirts!

Student C: But lots of other people had to live the same way. Probably nobody got a good education and maybe they all ate like pigs in a trough. That doesn't prove he hated it. Where does he say that?

Student B: He certainly didn't like it much; he seems to feel that he was left out of everything—no education, nothing good. He didn't even sleep in a bed until after he was freed.

Teacher: So far you all have talked about what he had or what he didn't have. Is there something else about being a slave that he suggests he didn't like?

Student D: Sure. He was a slave. He couldn't do what he wanted to.

Teacher: Is he giving an honest view?

. . . . . .

Student C: It's honest, all right, but it's still biased because he's a slave.

Student A: Oh nuts. Of course being a slave means he's got a bad opinion of slavery. Wouldn't you?

Student C: That still doesn't prove anything. Anyway we started out to find out what slavery was like. All we know is that one guy didn't like it. That only *proves* that *he* didn't like it.

(Following a discussion of a part of Fanny Kemble's Journal*)*

Teacher: True, she doesn't say (here at least) that slavery is bad, but what words does she use here to show distaste for it?

Student E: "Miserable," "wretched," words like that.

Teacher: These show you she didn't like slavery and that slavery was bad?

Students: Yes.

. . . . . .

Student C: All right, you said she was an actress who came from England to the South and she didn't like her husband who owned slaves. Wouldn't that mean she wouldn't like slavery because her husband liked it, and she didn't like him?

Student A: Oh, bosh!

(Following a discussion of a part of Susan Dabney Smede's Memorials of a Southern Planter.*)*

Teacher: Before all of you said slavery was bad because their homes were dirty and they didn't get enough to eat. Now this lady says that they treated their slaves well. And, remember, some of the slaves loved their masters and said [in Botkin's book] they were well-treated. Well, if slavery was bad before because living conditions were bad and they were badly treated, is it good if slaves are treated well?

Student F: Of course not. Slavery was always bad because one person can't "own" another one. It's not right.

Teacher: Many slave owners didn't think so. Neither did the man from Maine [J. H. Ingraham].

Student F: But they owned slaves. They were biased.

Student C: So were the slaves.

Commentary and Evaluation. It is difficult to identify completely what class members learned and what progress they made toward resolving their "problem" during these discussions. The scripts do reveal, however, a tendency on the part of some students to be precise in their assessment of data—to demand precision from others, and to drive other students and the teacher "to the wall" when their opinions did not seem sound. Where the degree of involvement and the intensity of feeling throughout the discussion is difficult to transmit through a script, the situation obviously revealed "perplexity" and problem-solving behavior. Moreover, the students did become involved with significant content from history.

Illustration B. If students have not been previously taught by problem-solving techniques, especially careful planning is needed. One teacher sought to initiate her class to the approach by structuring a problem situation in her eighth grade United States history class. She developed a problems lesson centered on Theodore Roosevelt and the Panama Affair. The major objectives were to introduce her students to the reflective method of thinking and to have students acquire a deeper understanding of the events leading up to and the implications of the Panamanian revolution. The topic for the exercise she felt was especially appropriate since it illustrates an important juncture in American foreign policy and also because the incident is neither excessively complex nor subtle and, thus, may be understood by the average junior high pupil.

The first step was to set up the problem for the class. The teacher began by having students read textbook descriptions of Roosevelt, the man and the President. She supplemented this by reading aloud to them other similar descriptions. These selections presented the stereotypic Roosevelt: the "sickly boy," the "strong healthy man," "the square deal," "a fair chance for all," and so on. Students also read descriptions of Roosevelt's administrations in textbooks.

When this reading had been completed, the teacher conducted a discussion intended to lead to the problem confrontation. The following dialogue is a resumé of this discussion.

Question: What did Roosevelt mean when he said that he stood for a "square deal"?

Response: That he would give people what was due them.

Response: That he would do what is right.

Response: That he wouldn't play favorites.

Response: That he would help persons who needed help.

Question: What kind of people, rich people, poor people?

Response: Common citizens, not just rich people.

Question: Did Teddy succeed in his aim of the "square deal"?

Response: Yes, I think he succeeded because he enforced the Sherman Anti-Trust Act.

Response: He got a pay raise for the miners.

Response: He helped the miners instead of the owners.

Response: He fought for the Pure Food and Drug Act.

. . . . . .

Question: Do you think, then, that Teddy Roosevelt was a good president?

Response: Yes, he did what was right.
Question: Would you say, then, that he stood for American ideals?
Response: He believed in equality for everyone.
Response: Justice.
Response: He believed in freedom.
Response: He believed in fair play for all citizens.

. . . .

Question: You think, then, that Roosevelt practiced "fair play"?
Response: Yes.
Question: This means, then, that he would never be, for example, a "bully"?
Response: No, not if he really stood for what was right.
Question: With this in mind I would like you to listen to this story of an event in the life of Roosevelt.

Colombia was a very small, weak, poor nation. Its territory once included what is called the Isthmus of Panama. At one time Colombia was offered a sum of money if she would allow the United States to build and *control* a canal connecting the Atlantic with the Pacific Ocean. The leaders of Colombia felt that they would lose control of their own land if they allowed the canal to go through. They also felt that the money offered was not really a just price. So they rejected the offer, hoping for more just terms.

As the southern states had tried in our own Civil War, a section of Colombia seceded from the union. Colombia wanted to stop this revolution in Panama, the seceding area. So Colombia sent, or wanted to send, troops to stop the civil war. However, a United States gunboat blocked the troops, which made Panama's revolt successful. Panama declared its independence.

This new nation of Panama desperately needed money, so it signed a treaty with the United States allowing our country to lease land in Panama, and to build and control the canal.

It was President Theodore Roosevelt who had ordered the gunboat "Nashville" to stop Colombian soldiers from ending the civil war. So the rebels were victorious. It was he who arranged the treaty with Panama which gave the United States permission to build and control the Panama Canal.

Question: Did Roosevelt use his superior American power to block the efforts of a weak country to hold itself together?
Response: Yes.
Question: Do you think Roosevelt really intended to use his power in this way?
Response: It sounds like that, but I don't know.
Question: Could you say that in a sense Roosevelt used American power to bully a weaker and defenseless nation?
Response: Yes.
Question: Was this fair play on his part?
Response: No, but he must have had some reasons for acting as he did.
Question: What might some of those reasons be?
Response: He felt that he had offered enough money to Colombia; his offer was fair.
Response: He felt that Panama had the right to secede from Colombia.
Response: He felt that the United States had the right to build the canal, since it was really needed.
Response: He was afraid that another country might get in ahead of the United States.
Response: He felt that the Panamanians were being treated unjustly and wanted to be free.
Response: He thought that building the canal would make him more popular with the American people.
Response: He felt that Colombia was greedy for more money, and wanted to show them what he thought of them.
Response: He was showing Colombia and the other countries of Latin America how strong the United States was.
Response: He was showing European countries how strong the United States was.
Response: etc. . . .
Question: Do you think that we can decide right away which of these reasons Roosevelt might have held?
Response: No, we must find out more information on this.

The problem that emerged here was to resolve the Roosevelt image with the situation that developed over the Panama Canal. The "reasons" listed by the students were actually their hypotheses for resolving this dilemma. The next step was to have students test their hypotheses by acquiring additional information about Roosevelt's motivations. The teacher presented brief excerpts from Roosevelt's autobiography and from Harbaugh's biography of him. The excerpts contained specific references to each of the reasons suggested by the class. Students were to read the selections carefully and respond to the following questions: (1) Do the authors agree on all the points in question? (2) If they disagree, are they on opposite sides, or is it that they just don't *quite* agree with one another? (3) What similarities and/or differences do you find between what the two authors say?

Following the examination of the excerpts, the teacher returned in a class discussion to the reasons for actions of the United States. The following dialogue describes the direction and the sense of this discussion.

Question: Did you find that the authors agreed all the time on all the reasons suggested for Teddy's actions?

Response: In a broad way, yes.

Response: In another sense, no.

Response: They were somewhat in agreement.

Response: Sometimes it sounded as though Roosevelt said one thing, but really meant another.

Question: Can you give an example of this?

Response: Yes, where Roosevelt talks about the canal as being a highway for the whole world, but it seems as though he means it is for the United States.

Question: Does this mean that Roosevelt is lying, or being dishonest?

Response: Yes, because you should say what you mean.

Response: You should try to be truthful.

Response: No, you can't always say exactly what you mean, because you might offend people.

Question: Was Roosevelt in danger of offending people?

Response: No, but he didn't want to sound "grabby."

Response: He was representing the American people, so he wanted to put his actions in the best light possible.

Response: He was proud of the American people, and American power, and he wanted to keep America strong.

. . . . . .

Question: Any other ideas about Roosevelt that come out in these texts?

Response: He also made it sound as if he was right and the other country was wrong.

Response: He made it sound as if he alone had made the decision, so that all the credit of the canal would go to him.

Response: Yes, but this would mean that he felt himself responsible for a big decision like that. Had he made a mistake, he would have taken the blame for that too.

Response: Roosevelt also sounded as if he were sure that he *had* made the right decision.

. . . . . .

Question: Does the fact that Roosevelt wrote his autobiography for publication, that is, that everyone could read it, suggest any reasons for his speaking the way he did?

Response: Yes, he probably wanted to make it sound right, so that he could convince everyone that he had done the best thing possible.

Response: Most people don't like to admit that they made a mistake on even a little matter, much less something as important as that.

Response: Perhaps he wrote his autobiography in order to be re-elected, or maybe he lost his popularity and wanted to regain it.

. . . . . .

Question: Why might author "B" be somewhat critical about Roosevelt?

Response: He knew more about Roosevelt because he had read more about him and the effects of this incident.

Response: He had had a space of time in which to look back on him.

Response: It's easier to decide about something when a length of time has passed.

. . . . . .

Question: Now that we have examined these references and discussed the viewpoints of the authors, could you decide which reason and/or reasons best answer our questions?

At this point the teacher asked the class to choose the reason which they thought best explained or resolved the basic problem. The reason most frequently mentioned by the class was Roosevelt's desire to build the canal regardless of circumstances, although several students held divergent views. Without prompting by the teacher, students raised the question of what effects actions such as these have upon the relations between the United States and other nations in the Western hemisphere.

Commentary and Evaluation. This illustration may be criticized by some as a mere adventure in debunking a hero. But the fundamental result of this kind of teaching is to make students more sophisticated citizens and patriots. Nothing is gained by a perpetration of naive and insipid handling of topics in American history.

The episode itself is an interesting instance of problem-solving technique. The "problem" is actually one which is posed or structured by the teacher rather than by the students, but it is evident that perplexity exists and the students appear to have a solid interest in it. The topic is narrow, but is nonetheless a significant event and one which is appropriate for the grade level. In addition, the problems created by the emergence of the United States as a world power are current enough so that learning from this situation may be applied to the understanding of current events.

THE PROBLEMS APPROACH IN GEOGRAPHY CLASSES

Geography is another frequently taught subject-oriented course in junior high school. Although generalizations about the nature of this course are difficult, it seems safe to say that it is most typically a descriptive treatment of the entire world or a large portion thereof. Teachers who wish to use problem-solving techniques in teaching geography to junior high students report numerous problems, the most frequently mentioned being the difficulty of providing "real" illustrations of geographic concepts and ideas, making students observant of landscapes, and escaping the "descriptive" orientation so that students are led to analyze data in the manner of the geographer. Illustrations in this section were developed by teachers of geography and were designed to indicate how the problems approach might obviate difficulties listed above.

Illustration A. The field trip has been a solidly advocated technique in the teaching of geography. Usually its major function is to bring students into close contact with the actual physical or cultural phenomena under study. As this illustration shows, it may also be used to set a series of problems for students to analyze.

Two seventh grade geography teachers in a junior high school near Minneapolis structured a field trip which they felt would allow their students to observe examples of the influence men have had on the physical environment. In addition they hoped to place their students in a series of positions where they must use several techniques of observation to "solve" problems posed for them.

The field trip consisted of a one day round-trip excursion from their school to the small city of St. Peter, located about 60 miles south of Minneapolis. At periodic intervals stops were made to allow close examination of the relationship between natural and cultural environments. In each instance, students were presented with a "problem" and directed to develop hypotheses to explain what they saw. Students were to complete individually a study guide for each section of the trip. For several days after their return, the classes discussed the hypotheses students had developed and attempted to come to some consensus about the problems which had been posed to them.

Portions of the study guides and brief descriptions of the discussions which followed when the students returned are included below. This guide was discussed with the class before departure.

Study Guide. The first part of your trip will take you through a wealthy suburb of Minneapolis, along the western edge of this city through other suburban areas, then along the southern rim of Minneapolis, and finally to the point where the Minnesota River empties into the Mississippi.

Read each of the following questions. As you travel through this area, take brief notes on the first two questions. When we make Stop #1, take a few minutes to answer the third question.

1. What evidence do you see of how wealthy the people are who live in these suburbs? (Student responses should include: country clubs, stables, foreign cars, double- and triple-car garages, large, well-kept homes, etc.)

2. Count the number of brand-new homes you can see being built in this area. How many new schools are under construction? How many churches? How many new gasoline stations did you notice? How old is the "average" home you saw in this area? (Students would notice a large amount of varied new construction.)

3. Now guess a little about the meaning of what you saw. If you had no other evidence than what you wrote down for questions 1 and 2, what could you say about this area? What kind of an area is it?

The discussion which followed the trip revealed that students had quite easily "guessed" that the area was a fairly wealthy one and that the suburban area farther from the city was by outward signs wealthier than the areas closer in. They also hypothesized that the new construction meant that the area was rapidly growing in population. They had more difficulty when asked by the teachers how they could prove their "guesses," but finally students began to mention comparisons with other familiar areas and more sophisticated data such as census reports and population maps. The teacher at this point showed maps of the population density in the county which confirmed one of the hypotheses about rapid growth.

The first stop on the field trip was at Fort Snelling where students were asked to assess the obvious original advantage of the fort as a defensive site overlooking the junction of two main arteries of communication and transportation. To reach the second stop, the group crossed the Mendota Bridge to the heights on the east side of the river. Then they were told to refer to two topographical maps of this quadrangle which had been given earlier. One topo map was drawn in 1922 before the Mendota Bridge was built, the other in 1957 after the bridge had been completed. The later map shows homes, apartments, and light industries lining the approaches to the bridge, and a number of other obvious differences in the landscape. Students were asked to explain the differences between the maps. Their "guesses" centered around the bridge and what its construction had meant to the pattern of roads, homes, and so on.

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Study Guide

Stop #5—Jordan (a small Minnesota town located on a creek about 30 miles southwest of Minneapolis).

At Jordan you will be asked to analyze the town's site, its resources, the original and present composition of the population, their occupations, and the present location of the major streets in relationship to Sand Creek and the railroad. To conduct this "town survey," we will allow you to do only three things: (1) visit the highest point in the town; (2) visit the town cemetery; and (3) drive slowly down the main street of the town.

Remember: You are to survey this town with no more information than you can see with your own eyes at these three stops. The specific questions you are to answer are:

1. *What resources did Jordan offer the early settlers?*
2. *About what year was the town settled?*
3. *What nationality were most of the early settlers?*
4. *How do residents of this town make a living today?*
5. *Why do you suppose this town was built on this particular site?*

Being asked to answer so many questions on the basis of observations made at only three locations proved confusing to students at first. They soon learned that they could find evidence of resources attractive to early settlers, present occupations, and guesses as to why the town was located where it is by observing from the highest point in town, that an approximate date of first settlement and an indication of the apparent nationality of early settlers could be had by examining tombstones. The data they collected were difficult to assemble and analyze, but in a discussion after the trip, the class concluded that Jordan was settled in the pre-Civil War era largely by settlers from Germany and Eastern Europe, that the town's ethnic composition has changed rather substantially since, that the town grew up around grain and saw mills on the creek, and that the present occupations consist largely of serving the neighboring agricultural region.

Study Guide

Stop #7—Le Sueur (a town on the Minnesota River about 40 miles southwest of Minneapolis).

Your only stop in this town will be at an historic monument. You should pay close attention as we drive through town for signs of industry. When we stop, answer the following questions.

1. What do you think is the major industry in town? (Student response: canning; a large Green Giant plant dominates the center of town.)
2. What does this tell you about what is grown on farms in this area? (Response: observation of farms as we travel south, crop maps of the area, and so on.)
3. How could you "test your guess" so that you would know it was true? (Response: observations of farms as we travel farther south; crop maps of the area; and so on.)

At a later stop in one of the most unproductive areas in southern Minnesota, the group observed the results of improper conservation practices by farmers on the highlands above the Minnesota River Valley. The students were shown a photograph of a hill taken several years previously. Then they observed that at the time of their visit the hill was badly eroded with deep gulleys reaching far down the side. Students were asked to make hypotheses which could explain the obvious differences in the appearance of the hillside on two occasions.

Commentary and Evaluation. Use of this specific illustration is, of course, confined to a small geographic area. But it is apparent that the same approach could be used by virtually all geography teachers wherever they are located. The pattern of asking students to observe and to analyze the natural and social phenomena around them and to become increasingly aware of man's impact on his environment has wide application.

The basic content described in this illustration could have been taught in several other ways. The teachers might have decided to stay at home and "explain" the various relationships which the class would have otherwise observed firsthand. Or the teacher might have decided to take the field trip, but at each stop to gather the class around them and explain to them what is meant by what they see. The fresh and different aspect in this example was the attempt to throw the students into the situation, ask them to observe, hypothesize, and, at times, test their hypotheses with other data.

Illustration B. One of the more difficult aspects of teaching geography at the junior high level is the apparent ease with which students tend to assume a cause and effect relationship between where men live and the way in which they live. This assumption of "geographic" or environmental determinism is often presented as the study of how environment affects men, how it determines what they will grow and what they will manufacture. Despite the constant complaint by geographers that determinism is not tenable as a geographic theory and their desire to expurgate it from the classroom, geography texts at the junior high level frequently abound in references to the overly restrictive effects of physical geography upon mankind. Even the topical outline of many courses (i.e., Wet Lands, Dry Lands) is suggestive of determinism. Thus, students learn easily that the physical nature of the Great Plains sets irrevocable limits on how people there may behave; the environmental characteristics of the Congo or of India are presumed to dictate how people will live. In such cases, students will "learn" social science data which are basically inaccurate and restrictive.

The solution to this teaching problem will probably be found in teaching which attempts to contradict determinism directly. One junior high geography teacher attacked the problem early in the school year through a series of map-reading exercises. His basic plan was to give the class just enough data to lead them confidently to an inaccurate conclusion, then to present them with additional data which contradicts the conclusion, and, finally, to ask them to reconstruct or redefine their original conclusion.

To begin the year, the teacher reviewed with the class the basic map skills learned earlier. Then he discussed with them the way in which geographers can represent various phenomena (*i.e.,* rainfall, population, vegetation) by the use of symbols of various types.

At this point, he introduced the map exercises by saying to the class "Now we shall see what a use of maps can do for us, and what we can learn about the physical world and how it affects people." He showed them four sets of overlay map transparencies and used the vu-graph to project them. In each case the base map showed the rainfall distribution of an area. Over this basic pattern he placed a population map of the same area and asked the class to come to a conclusion concerning the relationship they discerned.

The first area discussed was in South Australia near the Queensland border. This area has well under ten inches of precipitation per year and is classified as desert. The population overlay indicated an average density of less than two people per square mile. The class discussed this relationship briefly, and the teacher encouraged them to compare this set of maps with the more well-watered and populous eastern coast of Australia.

The teacher then asked for a clear statement of the relationship they saw. The class responded readily with statements such as: "People do not like to live in dry areas"; "People can't live where there is little water"; "Some areas are too dry to support many people."

Since the class had looked only at one area, the teacher responded that they had best be careful about making a broad sweeping statement. Other areas needed to be examined as well. The second map set dealt with the Sahara Desert in northern Africa with rainfall and population having the same relationship as before. Again, students were encouraged to compare their area with the coastal region where more rainfall and greater population are related. The teacher asked whether their original conclusions needed to be revised, but the students could see no reason to do so.

The third area examined was in the Kalahari Desert north and east of Johannesburg. Here the rainfall annually is more than ten inches on the average, and the area is classified as savannah rather than desert. The population density is still two people or less per square mile, and the students were gratified to see that their original conclusion did not have to be altered.

By this time, the class was secure in its conclusion. They knew and could verbalize the relationship with no trouble, and were ready for the *coup de grâce.*

The final map set concerned southwestern Arizona, including Phoenix, Tucson, and Bisbee. The base map again indicated little rainfall. The class was asked to make a prediction as to what the population map would show. Somewhat smugly they predicted that the previous relationship would prevail. The population map did not bear them out, for a substantially higher density of population existed here than in the other dry areas. Particularly startling, however, was the existence of a major metropolitan center of over a half-million people and several smaller population centers in an area which the class had predicted could not support a heavy population density.

The class, which had been complacent in the truth of their initial discovery, now became perplexed. Their easy generalization had proved inaccurate when used to predict, and they had been caught interpreting geographic relationships in a deterministic fashion. The teacher now set the problem for them: What went wrong? Why did the prediction fail? He informed the class that he would not accept excuses such as "But Phoenix is in the United States—that makes it different."

Students were then sent on an individual search for reasons for their collective blunder and then met in small groups to discuss the results of their search. They read descriptions of all four areas in geography texts, looking for differences and similarities. Under prodding from the teacher, they studied other maps of the areas seeking patterns which might be significant (i.e., native vegetation, soil types, natural resources, manufacturing, and so on).

After their search each student was asked to make a brief statement suggesting a new hypothesis for the relationship between population and rainfall. They suggested statements such as these. (1) Irrigation may be an important factor. Perhaps a desert region must have a large supply of water nearby to support many people. (2) Natural resources might allow people to live in a desert. Bisbee is in a copper-mining area; perhaps that explains part of the difference. (3) Many people like to vacation in a warm, dry area. This leads to a greater population. (4) Several students suggested that the original conclusion might have been a good one if slightly altered. Suggestions were as follows: Drier areas are not likely to have a large population. Men have to work harder to live in desert areas. Without irrigation, it's hard to make a living in the desert. Without minerals or water nearby for irrigation, a dry area will not support a large population.

Commentary and Evaluation. Some teachers may object to leading a class down an intellectual primrose path toward an inappropriate conclusion, but it would seem that in this instance at least the technique was justified. The problem was in a sense created for the class, but it does not seem contrived, nor was it truly imposed upon them. The class was "caught" in an embarrassing situation, "knowing" something which was not true. They had to work their way out of the situation by altering their original knowledge.

The conclusions or explanations ultimately arrived at by the class did not quite fulfill the teacher's expectation. He had wanted them to realize that a high level of technology is needed for large numbers of people to live in dry areas, and their responses indicated they did not quite go that far. But they had perhaps learned that sweeping generalizations are dangerous from limited data and that the relationships between men and land depend upon a complex set of factors, all of which need to be examined.

It is interesting to note that the same techniques can be used in a number of different situations. A teacher, for example, could use the relationship between wet lands and population. In this instance, well-watered regions of sparse population such as the Amazon Valley or Equatorial Africa could be contrasted with an area like Java, which has a far denser population.

Illustration C. This illustration concerns use of the problems approach which was not structured by the teacher but which grew rather out of a question from the class.

In an eighth grade geography class, the teacher was introducing a unit on Latin America by outlining briefly some of the physical characteristics of the continent, the general population pattern ("empty in the middle"), and some of the major problems faced by the people. In the same discussion, he attempted to indicate the potentialities of the continent by showing production graphs of minerals, hides, beef, and coffee. He also read brief quotations from *The Amazing Amazon* by Price which present the area drained by the Amazon as a land of milk and honey. At this point, one student raised a question. If so many resources exist there and if so much is produced there, why don't more people live there? The teacher could have answered this question with a brief comment, or he could have said "wait and see what we learn in the unit." Rather, he asked other students to respond. The result was a pouring out of all kinds of stereotypes, half-truths, and untruths—only certain people can stand the heat—it's all jungle—ferocious animals—snakes—poor transportation—lack of education. The inadequacy of the responses and the sharpness with which the students attacked the opinions of others indicated that this question deserved careful attention.

Here again the teacher could have decided to deal with the potential of the Amazon Valley by reference to several different texts. Because of class interest in a question of some importance, however, he decided to start this unit by having the class investigate this problem.

Class and teacher defined the problem in somewhat dfferent form than the original question. The problem then became "Why is Amazonia seemingly underpopulated?" Since the class had not been previously acquainted with the problems approach in a formal sense, the teacher identified the typical five step formula (define the problem, develop hypotheses, accumulate supporting data, analyze the data, and develop tentative conclusions). With the problem already defined, the class moved on to the other steps.

Developing Hypotheses. Students were asked to develop possible explanations above the level of "wild beasts threatening men" or "snakes" living in Amazonia. This proved difficult, and the class was able to state only two: the area is physically uninviting to many people; and transportation is too poorly developed.

The teacher had originally planned to group the class around hypotheses with each group to gather data to support it. But the lack of information about the area and the paucity of possible answers to the question led to a change of plans.

Accumulating Data. Each student was required to read descriptive material from several sources and to prepare maps comparing Amazonia with the United States in area and population. This provided each student with a basic store of knowledge about the area.

Then the students were grouped to collect data about a particular topic. Each group was responsible for an intensive search into its topic and for a report to the class. One group investigated the climate of the region, preparing maps, graphs, and charts to illustrate their report. Another group studied agriculture in the region; students collected pictures, drew crop maps, and even arranged for a film on the ill-fated attempt by Ford Motor Company to grow rubber on a plantation. A third group attacked the question "What is the true picture of mineral resources in Amazonia?". Another group studied the attempts of several South American governments to encourage settlement in the area. Several students worked alone on projects of interest to them. A doctor's son, for example, reported to the class on tropical diseases and special health problems in the tropics.

Analyzing the Data. This step consisted of the reports of the groups and discussion and analysis of the material presented. In each instance several questions were used to test the data: Are they accurate? How do we know they are? What do they mean? Do they help us answer the basic question?

Developing Tentative Conclusions. Following the reports, the class reviewed the basic data gathered in individual study and from the reports. Then they attempted to draw several conclusions which would bear on the question. After several false starts and much discussion, they developed the following tentative explanations. (1) Amazonia has been an uninviting place to live largely because of the hot, moist climate and the ease with which diseases spread. This reason did not seem sufficient, however, to explain the emptiness of the region. (2) The soil of the Amazon will support thick jungle growth (although jungle is dominant only in a relatively small part of the region), but heavy rains "leach" the soil of its minerals making it difficult to support widespread agriculture without constant use of fertilizers. (3) Since the Amazon is practically a "sea," transportation east to the Atlantic is no problem. North-south transportation is more difficult, even though roads have been built linking places like Belém with Brasilia, the capital. (4) The mineral resources of the region are plentiful, but getting them out is a problem. The general conclusions reached by the class were that several factors contributed to Amazonia's "emptiness" and that problems of health and transportation would have to be overcome before the region would attract a large population.

Commentary and Evaluation. In several ways this illustration was an excellent example of the problems approach. The "problem" came from an honest question from within the class itself, the students as a group were interested in its study, and the topic was one of social significance. As is so often the case, though, the class was unable to develop viable hypotheses *before* it had begun to collect data. Thus, the students' initial hypotheses were actually crude guesses rather than true hypotheses. Also, there was no opportunity for these students to act upon their conclusions; they could not populate Amazonia. But their true problem, the answer to a question, was solved by this study.

As with several other illustrations, the content here could have been "taught" more quickly through a teacher-answer to the question. Not all such questions that arise in a class can or should be answered by the problems approach. But students need to be faced, as these were, with relatively straightforward questions for which they can seek their own answers.

THE PROBLEMS APPROACH IN GOVERNMENT CLASSES

Another typical course in junior high school is the one labeled "government" or "civics." While the content of the course most often centers on local and state government, in some schools topics such as driver education and occupations are also included. Thus, the course is often fragmented into sections or units which have little relationship with other parts of the course. Furthermore the dimensions and the role of local and state governments are virtually unknown and seem unimportant to students. Little attention is focussed on local government in the mass communications media, and neighborhood interest is very often concerned with such uninspiring topics as "holes in the streets," "lazy" or "inefficient" municipal service departments, and constant battles over complicated tax measures in the state legislature.

The lack of knowledge and interest illustrates perfectly the need for instruction directed toward the overlapping nature of local, state, and federal government in the United States, the problems of municipalities which are occasioned by the booming urban complexes, and, indeed, about the basic functions and purposes of government. These problems contain the potential for rich and significant teaching.

Illustration A. One teacher of ninth grade civics in a suburban community decided to organize a unit on local government using the problems approach. The school's curriculum guide called for a period of twelve weeks on this topic. The standard procedure was to deal with the structure of municipal government spelling out the various types or options from which communities might choose. The emphasis was upon the duties of the various community officials and the advantages and disadvantages of the types of local government.

Dissatisfied with this approach, the teacher decided to broaden the scope of the unit by directing the attention of his class toward such questions as "How is our community related to the whole metropolitan area? What basic problems do we face? How are these problems being solved? What in general are the problems faced by metropolitan governments? How can individuals contribute to the solutions of these problems?". These questions were not intended to provide the structure of the unit, but rather to define in general the scope of the unit.

The teacher hoped to lead the class to define the most significant problems to be considered. He began the unit by using highway maps to locate the community in relation to the metropolitan area and by showing them figures on recent growth in population. He concluded with the statement that it was his belief that since the community was part of this larger metropolitan area, it had no right to an independent existence. It ought, he claimed, to merge with or be incorporated by the central city.

While the community was relatively old, it had only recently grown to a substantial population. Residents had developed a high degree of community pride and spirit in their growth, in their accomplishments in meeting the needs of people, and in their school system. The students had apparently internalized their pride, for they reacted against the teacher's suggestion, asking for his justification. He explained his point of view by pointing out that theirs was essentially a "bedroom" community which drew its economic sustenance from the central city and was therefore closely related to the broader metropolitan community. The problems of the area were enormous; having a large number of governments with different local regulations only made solution of the area's problems more difficult.

This opening ploy had the desired result. While the class was not stimulated to the point of pulsation, class members did raise questions which revealed both ignorance of the community's problems and some interest in learning about them. The teacher then indicated the following "problems areas" to be investigated: How can our community solve the problems facing it? (What are its problems? Does the type of local government stand a chance of solving them? What measures are being taken?) How can the metropolitan area solve the problems of its citizens? (What are these problems? What is being done to solve them?) How can individuals or groups work to make this area a better place to live?

The class formed several groups to gather information dealing with some aspects of these broad problems. Each group was to plan its own procedure, but was required to gather information and report to the class on its findings and recommendations. Committees were allowed to meet during the class hour for fifteen minutes two or three times per week. This time was spent in planning the group's activities out of class and in preparing their final report. Most of the class hours were spent in discussing common readings on local government. Through their readings and discussions the class learned about forms of local government, the general problems of the growing metropolitan regions, and the problems created by overlapping systems of government.

Toward the end of the unit, the committees gave reports which centered on their recommendations for solving the problems. The reports are too extensive to describe here, but certain aspects which indicate the range of activity and interest on the part of the committees and individual students are worthy of mention.

1. One committee became interested in a local controversial issue—whether a hospital maintained by the central city should be taken over by the county, in which case all suburban communities would be partially responsible for its support. To get some assessment of what the general feeling was in their community, members decided to take a poll. Their polling technique was probably very poor, as was their questionnaire, but they did learn that a high percentage of adults had no opinion or were completely ignorant of the question. Appalled by these results, students raised the question of indifference and apathy in their report and made several suggestions toward improving communication and building interest in local affairs.

2. Another group was preparing a report on slum problems in other cities when the teacher suggested that they might deal in problems closer to home. Several students, although skeptical about the existence of slums in this metropolitan area, agreed to talk their parents into driving them through certain locations designated by the teacher. They did indeed find slums there and took slides of slum housing for use in their report. Members of this group also read parts of *How the Other Half Lives* by Jacob Riis, *Shame of the Cities* by Lincoln Steffens, Harrington's *The Other America,* and several other sources dealing with the problems and effects of slum life.

3. The role of the major political parties in local politics became the major topic for a third group. Stu-

dents were unaware that the parties had any interest in the local scene until the teacher suggested that they might interview the ward chairmen. They quickly learned that although local elections were held on a nonpartisan basis, the major parties backed candidates unofficially and took a stand on some local issues. A more important result of these interviews was to get students interested enough in the political scene to attend ward meetings of the major parties.

4. A group investigating planning and zoning problems in their community became interested in the lack of provision for general recreational facilities. They hoped to survey the area to find sites appropriate for recreation, but houses and stores, they learned, had expanded into practically every available square foot leaving no surplus for other needs. While their report could contain no action or solution to the problem, it did chide none-too-gently earlier planning and zoning councils for their lack of foresight.

5. School needs and problems drew the attention of one group. They originally were not aware that schools were run by a separate governmental agency and were surprised to find yet another unit involved in local affairs. From interviews with school board members, teachers and administrators, they learned something of the problems of keeping up with school needs in an area of growing population and rising land values.

Commentary and Evaluation. As this illustration shows, a study of local government need not be excessively dull and drab. Rather, it provides a rich and varied resource for significant teaching and learning. This teacher succeeded in arousing interest and in pointing that interest toward significant knowledge about local affairs. More interesting are the several allusions to action on the part of students. Although they were not able to solve the problems they studied, they did to some degree become more active in and aware of the community's attempts at solution.

Illustration B. A ninth grade social studies teacher in a suburban school near Minneapolis was faced with a seemingly impossible task. The curriculum guide for his school called for a one semester course in government covering the following topics: Citizenship and What It Means; National Government—Origin and Structure; Our States and Territories; Minnesota Government; Local Government and City Government; Financing Our Governments—Local, State and Federal. According to the curriculum guide, this course was to be organized into topical units, each taught for a period of three to four weeks. With such a crushing burden and an unrealistic organization, teaching in a worthwhile fashion and providing any stimulus toward interest seemed extremely difficult.

Furthermore, the teacher sensed during the first day that students held the course in low esteem and expected little from it. From previous classes, they had learned what the course was like—a rather dull recital of branches of government; a mastery of federal, state, and local officials, their salaries and duties; and an analysis of how taxes are collected and monies dispersed. While they were not exactly in a state of anomie, students did appear apathetic and approached the course with dread.

Although this was his first year in the school, the teacher decided to conduct a rather drastic experiment with one of his five sections. By setting a "problem" for his class, he hoped to inject some life into the group as well as to provide a meaningful learning experience. He began by asking the class several questions: Why do we have governments? What are they supposed to do? Do you or your parents have any part in government? How should a citizen act? As anticipated the answers were inadequate and desultory. Students conjured up a few of the catchy, meaningless phrases they had learned about government in various ways, but it was apparent that the concept in any functional sense was obviously a mystery to them.

The teacher then proposed that the class learn about government by spending some time trying to govern themselves in a responsible fashion. He suggested that this would require the preparation of some rules in the form of a "constitution" for the class. When this step had been completed, the class would be free to choose the kinds of topics and problems from the course outline that seemed most significant to them.

In this situation it is a little difficult to tell exactly what the "problem" is because it has not been clearly specified. The teacher stated the problem as follows: For what purposes do governments exist? The students undoubtedly saw the problem somewhat differently, perhaps as: How can we organize ourselves so as to meet the teacher's expectations? The teacher has attempted to create some tension within the class by placing them in a position which demands that they act to solve both his problem and their own. To put it simply, the teacher is assuming that because the class feels tension or perplexity, they will move to answer the question he posed.

The first task, then, was to develop a constitution. This required a "convention" which was to be held over a one week period during the class hour. The teacher divided the group into four "states" of seven or eight students each. All students were designated as delegates to the convention, but each "state" elected a governor to organize meetings within its group. Since the teacher refused to play a larger role in organizing their study, the students were left to their own resources in planning and running their convention. The teacher described what happened as follows.

"On the first day of the convention, I took a seat in the back of the room without giving any instructions. Confusion and indecision was widespread throughout the room, and no doubt teachers nearby wondered what was going on. Above the chattering someone placed a classmate's name in nomination to serve as chairman of the convention. This was followed by unanimous approval and election of a secretary to record the proceedings. The rest of the hour was characterized by considerable discussion and some foolishness; however, it was decided that the government shall consist of three branches, legislative, executive, and judicial. Further deliberation concerned the legislative body. Not much, but enough for a start.

"The second day moved along more smoothly, but the frustrations of giving up individual preference for majority rule were felt by many of the students. Some discussions became heated and revealed the need for a set of procedures which would govern the presentation of motions. One boy, who had objected to the lack of order during the previous day's discussion, brought Roberts' *Rules* to class and was able to get the group to adopt the book as a way of bringing more order to class discussion.

"By this time, interest, which at first had been moderate, was high. Students in my other classes wondered why first hour had been chosen for this experiment and their class ignored. Fellow teachers inquired about the experiment having heard comments from the students in the halls and in other classes.

"The convention lasted five days. Some would no doubt consider this too long, and others would probably regard it as wasted time. It is my belief, however, that these were the most productive five days of the entire school year. Each student had in some way participated, even though as in any group activity a small proportion dominated. Moreover, the experience was a completely realistic one for students since they were actually involved in making decisions, not merely acting out events in a hypothetical sense. (*Diversity of opinion and the calling for a division of the house on certain issues were reminiscent of experiences I have had at political party caucuses.*)"

With the constitution written, the class set about organizing their future work. The first order of business was to create cabinet posts and executive departments. A "Bureau of the Census" was created to perform the routine tasks of taking roll and keeping attendance records. A "Government Printing Office" was formed to distribute tests and to draw up supplementary dittoed materials. The "Department of Labor" was delegated the responsibility to study "working conditions and class assignments." All official papers and laws passed by Congress were to be kept by a "Secretary of State."

When these tasks had been completed, the class decided that their first unit of work would be local government. They planned this unit completely using the rules they had developed in the constitution to guide their decisions. Space prohibits a complete description of their activities, but several are significant enough to list. (1) The group contacted members of the Metropolitan Planning Commission and obtained its reports on population trends and economic developments in their community. (2) Members of the local planning committee were contacted to identify local problems worthy of study. The city manager provided the class with copies of the city's annual report together with other pertinent information. (3) Discussion and study of problems in local government brought about a desire to participate in some community project which would promote greater understanding of community problems and possibly provide some service to the city. A small group of students conferred with the city manager about the project and recommended a survey of some 500 homes to find out popular community attitudes toward the city as a place to live, toward municipal services, and toward issues facing the community. The survey also got at citizens' knowledge of governmental officials and the areas of government most interesting and vital to residents. The results of the survey were perhaps moderately valuable to city officials, but most certainly of great significance to the class. Class members were righteously appalled at the lack of information and the general apathy of the community toward local government.

On the basis of these and other activities, the teacher felt that the students had developed a realization of the need for government and an appreciation of some of the problems inherent in a democracy. The interest level was higher in this class than in the teacher's other sections which approached the topic differently. Students in this section also read more books and displayed more interest in community affairs.

Commentary and Evaluation. Assigning a class to write a constitution is hardly extraordinary. When such an activity is assigned, the teacher will usually present the class with a "cookbook" approach which tells students how to proceed. An unusual and noteworthy element in this illustration was the teacher's willingness to take a chance and give his class virtually complete responsibility for organizing their work.

Obviously, this was not the usual kind of problems situation. One might wonder whether there was a "problem" present in any typical sense of the word. Yet the class certainly showed signs of perplexity and the desire to become involved with the content being studied. The key to the success of this experiment was undoubtedly the interest generated by the unusual approach. Once involved in the process of making their own decisions, the class readily took hold of planning and attacking their work. Despite the uncertain direction they received from the teacher, the class rose to meet a challenge and undoubtedly accomplished some significant learning.

THE PROBLEMS APPROACH IN CORE, FUSED, OR BLOCK-TIME CLASSES

Another typical mode of organizing social studies instruction is into larger blocks of time than a regular class period. Although such classes are normally assumed to combine learnings from several social science areas or from another subject area and a social science area, not all such organizations represent "true" core or fusion of content. Many teachers teach one hour of social studies and one hour of English. Nevertheless, the class setting and flexibility usually accorded the teacher provide excellent opportunities for using the problems approach.

Illustration A. Since his class was of far higher than average ability, one teacher felt his students were capable of handling a series of fairly sophisticated and complex problems. At the beginning of the year, he listed a number of problems and suggested that the class choose the ones they would like most to study and the order in which they should be done. His list included minority group problems in the United States, the potential effects of automation on people, and the farm problem. These were units which the teacher had previously prepared and taught and were structured so that the language skills would be taught in connection with the social studies content.

The reaction of the students was positive in all respects but one. Several were already perplexed over the rash of attacks upon United States embassies overseas and the rough treatment given to United States Information Service offices. It seemed to them that time could be profitably spent in trying to discover why these acts had been committed. Their image of the United States was one of a world leader trying to help other nations, particularly underdeveloped ones. Why did we receive this type of reaction?

The question in the minds of the students appeared quite genuine, and the teacher allowed the class to proceed. He told them that they must follow the regular problem solving approach, first defining exactly what the question was, then gathering information which bore on it, developing solutions (hypotheses) which explain or answer the question, and then testing their solutions or answers.

The class began by developing a specific question to answer. To ask simply "Why do many people appear to dislike us intensely?" seemed naive and ridiculous to the students. After trying several alternatives, they finally decided to define the problem as: What can our people do to improve the picture of the United States abroad? The teacher pointed out that this question assumed that our image presently was bad; this he maintained was not so. Also, he felt that the class should get some background on what have been our foreign policy problems in the past. Without this they would probably succeed only in giving inappropriate answers to the question.

The first step in gathering information was to study some aspects of our foreign policy in the past. Class members read history texts to accumulate background information on significant events in foreign affairs in the past. Since these texts did not treat topics in depth, the teacher prepared brief case studies of four sets of past events: (1) Involvement of the United States with European nations during the Napoleonic period; (2) The quarrels with Mexico over the southwest; (3) Relationships with England during the Civil War; and (4) Our involvement with the Open Door policy in the Far East. These cases were presented to the class in dittoed form. Each one contained a statement of facts describing the events discussed, identified the interest of the United States in these events, and raised questions dealing with the general policies illustrated in these events. Students studied these cases individually and then used them as a basis for class discussion.

To study more recent foreign affairs questions, the students prepared brief "cases" patterned after the teacher's attempts. They used the *Reader's Guide* and the current events magazines to which the school subscribed to find articles dealing with commitments of the United States in the post-World War II period (NATO, SEATO, and the UN), the Cuban crisis, the Korean War, the Guatemalan affair, and attacks upon United States embassies. These events were discussed individually in class. The teacher invited an Asian foreign student at a nearby university to talk to the class giving his impressions of how the United States was viewed in his country. An ex-member of the Peace Corps also came to speak, giving her reactions both to the work of that organization and to the attitude of people in other countries toward our nation. A teacher in the school who had spent a year teaching in West Germany gave his reactions to the group.

Following these activities, each student was required to write an essay which summed up the information studied and listed one or several possible answers to the main question. The teacher read and graded the papers and used student comments as the basis for a class discussion. The class agreed on several general conclusions which, in substance, were as follows: The United States had become involved in all major European wars since we became a nation; this was an illustration, they felt, of the interdependent nature of the world. We could hardly escape playing a large role in world affairs in today's world. Although the United States has at times overpowered smaller and weaker nations, we have also at times acted responsibly in settling disagreements with other countries. The "image" of the United States abroad is probably not as bad as generally believed. Foreign governments often use the United States as a whipping boy; some of the attacks are staged by the governments. The actions of any large and powerful nation are bound to be criticized.

Despite the sophistication of some of these statements, students were frustrated when they tried to answer satisfactorily their original question. To some the question had now become a simple-minded one; the information they had examined had introduced them into a few of the complexities of international affairs.

Commentary and Evaluation. This illustration has several attributes of an excellent problems situation. The problem centered in a real concern of the class and the question was a significant one. At the same time one might question the nature of the problem itself. As originally stated it was certainly naive and, of course, it was not answered by the class. Still, the class did apparently acquire a broader perspective on the role of the United States in world affairs and a better understanding of international problems.

Illustration B. *(This illustration was originally published in the previous edition of this Bulletin and is presented here in revised form with the kind permission of Veronica E. Casey and Raymond H. Muessig, authors of the junior high chapter in that volume.)*

After a preliminary discussion of the problem area of economic security . . . [a] ninth-grade social studies class . . . defined their general problem for study as: "How can economic security be assured for American families?". The subject was selected because it is a matter of much concern to American families, some with vivid memories of depression years and all watchful of the present inflation which has consumed a large portion of their savings. The many bills in Congress relating to this topic and the labor unions' efforts to expand fringe benefits filled the newspaper columns. The students were personally affected by the problem since many are part-time workers and well aware of the relationship of earning to spending.

Approaching the subject on too personal a basis might have involved embarrassing disclosures of family finances; therefore, the teacher asked the class to write papers on "My Ideal Family."

Some pupils felt that security of employment was most important. Others hoped to become independent businessmen. Some considered good health the most important basis for happiness. All these papers presented to the teacher an excellent departure point for the discussion of those hazards which threaten families. At the same time, the pupils were reading such novels as *Alice Adams* by Booth Tarkington, *The Pearl* by John Steinbeck, *The Yearling* by Margaret Rawlings, *Man of the Family* by Ralph Moody, and *A Tree Grows in Brooklyn* by Betty Smith.

The class discussed some of the papers on "My Ideal Family," some of the novels they had read, and some of the newspaper clippings they had brought. From these sources they were able to recognize the various factors which endanger economic security of the family, and to define the social problem: "How can sufficient earnings for American families be assured to safeguard them against such unexpected hazards as death of the breadwinner, old age, unemployment, and accident?".

(Students then divided the main problem into subproblems which were investigated by six committees.)

The first committee studied the historical factors which have affected family security: the change of the country from an agricultural to industrial character; the increasing proportion of the aged in the population; rapid scientific advancement. With the rising standard of living came also such disadvantages as boom and bust, industrial hazards, and so forth. They examined the change in attitudes toward insecurity—from passive acceptance to an ever-increasing awareness of the public responsibility to solve this problem.

(The class visited the Sirovich Day Center which provides organized leisure programs for old people. From their interviews there, the committee observed that old folks tend to play less active roles in industrial urban communities than they did when the country was predominantly rural.)

The second committee investigated how individuals by their own efforts, through better training, wise budgeting, and proper investment of savings, can meet the unexpected hazards of life. This committee interviewed a stock exchange broker and a banker. One member visited the post office to find out how the U.S. Postal Savings System works. From their reading they concluded that today the income and savings per person are the highest in U.S. history, but that a large percentage of American families still has insufficient savings to cope with the unexpected. Complementary programs therefore are needed. They talked with a social worker from the Family Services section of the Community Service Society who explained to the class how private organizations such as theirs help unfortunate families.

The third committee turned its attention to the business pension plans. They interviewed a staff member of the National City Bank of New York who is a consultant to various schemes. The class was fortunate to be invited by U.S. Steel Corporation to visit their Fairless Steel Plant in Morrisville, Pennsylvania. This trip very dramatically revealed to them the great achievement of our science, industry, and technology in increasing productivity, and thereby raising the standard of living. At the plant they learned about and observed the most modern safety devices and programs, and through interviews with company officials became acquainted with the pension plans and other welfare programs of the company. For one who had watched the project from the beginning, it was at this point clearly noticeable from their questions that the pupils had grasped important economic concepts. Some of the questions they asked were: "Does the use of labor-saving devices create serious technological unemployment?" "How does the corporation invest its pension funds?" "What are the fringe rewards of the workers?" "Is the housing project built near the plant a 'company town'?"

The fourth committee surveyed the role of organized labor in improving the standard of living for American workers. The committee visited the International Ladies Garment Workers' Union headquarters and health center. The educational director of the union discussed the history of the American Labor movement, and how the unions, through collective bargaining and through their own welfare programs, have bettered the economic status of their members.

To the fifth committee fell the intricate job of investigating the federal, state, and local programs of social security and assistance. They visited a local social security agency, the state employment service, attended a hearing of the Workmen's Compensation Board, and took a field trip to a physical and vocational rehabilitation center maintained by Columbia University.

A sixth committee was set up to explore how other countries cope with the problem of family security. They discovered that different cultures attach different meanings to family ties. In the Near East, Latin America, and India, the family ties are stronger and more pervasive than in such a highly industrialized country as the United States. They also discovered that rigid class distinctions obstruct social and economic progress. This committee visited the offices of the International Labor Organization where economists from different countries explained the magnitude of economic insecurity in underdeveloped and war-torn areas. The committee, moved by this experience, organized a fund raising campaign in the school and collected over $50 which they turned over to the United Nations International Children's Emergency Fund.

After six weeks of study, the class was ready for their culminating activity. Each of the six committees presented its report to the group, using drawings, skits, debates, and several other techniques to emphasize their major generalizations.

The topic of family security offers abundant opportunities for integration with other studies. The subject of family has been used in the arts and in literature. Family living can be used in studying the cultural patterns of all countries. The U.S. Congress' concern with the protection of the American family offers an excellent springboard to the study of civics and history. And since the family is an important spending unit and a source of labor force, it is a good medium not only for the study of personal economics but for a study of the effect of individual decisions upon the total economy.

The greatest virtue of the project was that economic security was placed in its proper context. The pupils discovered that in our complex industrial society great economic forces shape the economic and social patterns of the family, and that these forces can be offset only by the cooperative action of all the individuals through their intelligent decisions when policy is made.

Commentary and Evaluation. This illustration is in several ways a "classic" problem situation. The students defined the problem and the subproblems well. Although the content was drawn primarily from economics, there is evidence that the students drew from other areas as well. The work of the committees was impressive, and their reports seem to have been done in creative fashion.

Summary

This chapter has included a brief rationale for using problem-solving techniques and, in greater detail, a number of classroom illustrations. The specific situations attempt to illustrate how problem solving may be used in several different ways across a wide range of course organizations and topics.

No claim is made that the instances presented here will apply universally. It is readily apparent that the problems approach may assume many forms and may have many effects upon students. A real problem to one group of students will not be seen as such by another. Indeed, within any class there will be wide variation in perceptions of what constitutes a problem. The illustrations do present, however, ways that some teachers have found to create a more significant learning climate for their students. A basic assumption of the chapter has been that other teachers may find them useful.

FOOTNOTES

[1] Michener, James A. "Who Is Virgil T. Fry?" *The Clearing House,* XVI: 67-70; October, 1941.

[2] Riesman, David. *Constraint and Variety in American Education.* New York: Doubleday and Company, Inc., 1958. p. 127.

[3] See the letter from a disenchanted teacher quoted in Wesley, Edgar B. and Wronski, Stanley. *Teaching Social Studies in High Schools,* Fifth Edition. Boston: D. C. Heath and Company, 1964. p. 179.

[4] See, for example, Dewey, John. *How We Think.* Boston: D. C. Heath and Company, 1910. Griffin, A. F. "A Philosophical Approach to the Subject Matter Preparation of Teachers of History." Unpublished doctoral dissertation, Ohio State University, 1942. Hunt, Maurice P. and Metcalf, Lawrence E. *Teaching High School Social Studies.* New York: Harper, 1955. Hullfish, H. Gordon and Smith, Phillip G. *Reflective Thinking: The Method of Education.* New York: Dodd, Mead and Co., 1961.

[5] Hullfish and Smith. *Op cit.,* ch. 3.

[6] *Ibid.,* p. 212.

[7] The illustrations used in this chapter were supplied by the following people: Sister Anton Schillo of the St. Paul, Minnesota Diocese Schools, St. Paul, Minnesota; H. Thomas Collins of the African-American Institute and Gerald Pitzl of the Orono, Minnesota, Public Schools; Everett Keach of the University of Georgia; LeRoy Olson of the Richfield, Minnesota, Public Schools; and Clayton Diskerud of Carthage College, Kenosha, Wisconsin. The writer expresses his gratitude for permission to use these classroom illustrations.

Chapter 4

The Problems Approach and the Senior High School

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> And this I believe: that the free, exploring mind of the individual human is the most valuable thing in the world. And this I would fight for: the freedom of the mind to take any direction it wishes, undirected. And this I must fight against: any idea, religion, or government which limits or destroys the individual. This is what I am and what I am about. I can understand why a system built on a pattern must try to destroy the free mind, for this is one thing which can by inspection destroy such a system. Surely I can understand this and I hate it and I will fight against it to preserve the one thing that separates us from the uncreative beasts. If the glory can be killed, we are lost.
>
> —*John Steinbeck*

As I envision it, the primary goal of the senior high school should be to produce the intellectually autonomous individual; the individual who can arrive at his own conclusions based on the relevant facts. To produce the autonomous individual—the self-directing person—the school must help the student discover his identity; that is, help him come to know who he is, what he values, and what he wants to achieve.

The social studies program within the senior high school can play a key role in achieving this goal. The content of the social studies, if approached from a problem-solving orientation, is rich in opportunities to develop the skills and insights, and values, required for a reflective resolution of problems.

For the student to gain a sense of identity he must come to understand the salient features of his social environment; he must come to grips with the crucial issues imbedded in his culture. Furthermore, as he makes sense out of his society, as he resolves social issues reflectively, he must then determine the significance of the meanings thus acquired for his pattern of values. When doubt is resolved, when a social situation which was confused has become clarified, then the meaning acquired needs to be related to the value structure of the student. Thus, the student gains insight into self through the recognition of the significance of meanings derived in problem-solving for his concept of self.

The problems with which the student comes to grips within the social studies classroom are social, the meanings which he derives from their solutions must become personal if self-knowledge is to be attained. A student, for example, addressing himself to the question, "How can Negroes acquire decent housing?", is involved in a social problem and he is dealing with social studies content. The student may conclude that "open housing" is a necessary condition for a solution to the problem. If so, he has arrived at a solution to the problem. Assuming that the quality of the thinking that took place in the process of problem-solving was of a high order, the meaning distilled from the process is significant. If problem-solving is to contribute to intellectual autonomy in this instance, the student must ascertain his reactions to the principle of "open housing." Thus, in engaging in the solution of social problems, the student gains meaning which when referred to the self affords knowledge which results in clarification of identity.

Assuming that we develop the intellectually autonomous student, will he face frustration and become alienated from his society due to the complexity of modern life and the centralization of decision making? Aware of social problems and skillful in arriving at a satisfactory logical solution, will he feel powerless to effect change, to realize his solutions? This outcome seems unlikely, since the student will be aware of the social forces and the organizational structures inherent in society. He will be cognizant of the organized groups and the influential individuals that effect change in society. Hence he will be able to effectively engage in "the passions and actions of his time."

Will the student use his skills to gain selfish, antisocial ends? There is no certainty in this matter, since the very nature of autonomy precludes determination of the values sought by the student. However, by involving the student in the crucial problems of society he is immersed in the human condition. He is sensitized to the troubles and the tensions of his fellow men by the very focus of the social studies curriculum. Furthermore, since an effective use of the problem-solving approach requires an intellectually permissive classroom atmosphere—an atmosphere in which the student's contribution is courteously and fairly entertained—the student experiences sensitive inter-personal relations and is expected to accord it to his fellow classmates. Hence, living within a socially sensitive classroom atmosphere, immersed in the problems of mankind, the likelihood that the student will develop into a socially conscious individual is quite probable.

Next, let us turn to an examination of the atmosphere which must exist if problem-solving is to occur. If the student is to become engaged in problem-solving he must be doubtful, uncertain or puzzled concerning something within his experience and have the desire through inquiry to remove the doubt. As long as he is certain of the truth or goodness of a particular idea or action, or as long as he is unconcerned, indifferent about the matter, he is not involved in problem-solving.

Hence, the initial task confronting the teacher is that of creating the state of uncertainty or doubt in the mind of the student. Obviously, in instances where the student brings the doubt to the classroom this initial stage is eliminated. But for the remainder of the students, and in most cases for reasons outlined below this will be a majority of the class, the teacher must implant the element of doubt.

Let us now consider why students seldom bring doubt to the classroom. Most classrooms are places where doubt is not prized. Classroom activity consists largely of producing right answers. Usually the atmosphere is one of certainty, not doubt. The classroom activities often consist of recitation in which the student is required to recall specific facts in an atomistic context. Certainly doubt is not demanded. The very fact that formal education must take place within the confines of a social organization discourages an emphasis upon the nurturing of doubt and the fostering of inquiry, for social organizations tend to be conservative.

Furthermore, to doubt, to question, is discouraged by major forces in the larger society. As bureaucracy pervades an ever-increasing area of our social organizations, as the organization man becomes more the prototype of modern man, as increased urbanization creates more complex social relationships, as military service becomes more widespread, the general social climate discourages a spirit of doubt and inquiry. The senior high school student increasingly is aware of these forces as he anticipates his greater immersion in the larger society upon graduation. He senses that a life of inquiry may lead to difficulties both personal and occupational. Hence he is reluctant to subscribe to the examined life.

Creating the Condition of Doubt

Since the presence of the element of doubt or puzzlement is a necessary condition for the initiation of problem-solving activity, let us consider teaching strategies which are likely to evoke such reactions. The teaching strategies can be grouped in the following categories for the purpose of examination.

The teacher can present the students with a problem within the context of the content.

The teacher can encourage the students to discover a problem within the context of the content.

The teacher can convert the unexamined beliefs of students into problems.

The teacher can point up conflicts within students' patterns of beliefs, thus creating problems.

The teacher can point up conflicts within the course content, thus creating problems.

Each of these methods of creating the element of doubt is discussed in the sections which follow.

Presenting the Students with a Problem. One method of creating doubt is for the teacher to present the class with a problem at the beginning of the discussion period. The following excerpt of a discussion in a high school American history class illustrates this method.

> *Teacher:* Today we are going to consider our domestic history from the close of the War of 1812 to approximately 1830. I noticed a curious thing in reading over our assignment. Calhoun led the fight against the Tariff of Abominations, and yet (your text doesn't mention the fact) in 1816 Calhoun favored a high tariff policy. How do you account for his changing his mind?

It is conceivable that the students will not see the lack of consistency as a real problem. After the teacher has done all that he can to make the lack of logic clear, if the students do not accept it as a genuine problem, then for purposes of the problem-solving approach the situation is meaningless. More facts have been covered, that is all.

If, however, the students do become interested and are actually puzzled by the contradiction involved, then the discussion can go forward. Let us assume that in the present instance the students are genuinely puzzled by the situation. In answer to the question of why Calhoun changed his mind on the tariff question, a student replied, "Maybe he got smart." Then the discussion could proceed in the general manner indicated below.

Student: Don't be silly. Calhoun was smart long before 1828. South Carolina elected him to Congress long before then. He was a War Hawk—remember. The people of South Carolina wouldn't have elected him if he was stupid.

Teacher: Now let's be certain we see clearly what we are trying to find out. Is this it: Why did Calhoun in the 1820's change from a position of advocating a high tariff policy to one of strongly opposing such a policy? *(Several pupils nod in agreement.)*

Student: What's an advocate?

Teacher: An advocate is a person who believes in a particular thing and tries to persuade others to accept it. For example, Calhoun in 1819 believed in a protective tariff and tried to persuade others to favor this policy. Is that clear?

Student: Yes.

Student: I think I know why Calhoun changed his mind. Calhoun and Jackson were friends until after Jackson became president, when they became mortal enemies. Then when Jackson supported the Tariff of 1828, Calhoun had to oppose it because of his dislike of Jackson.

Student: I saw a movie on television the other night that showed Jackson in the Battle of New Orleans. There was this pirate, I don't remember his name, that helped Jackson.

Teacher: I believe that you are referring to Laffite. But aren't we getting somewhat off the subject? Let's see, what were we trying to find out?

Student: We were trying to figure out why Calhoun switched from favoring a protective tariff to opposing it.

Teacher: Yes, that's it. Now let's go back to the statement that Jackson and Calhoun had been friends but that later they became enemies. Then when Jackson favored a high tariff Calhoun opposed it in order to fight Jackson. Does that make sense?

Student: No.

Teacher: Why do you say, "No"?

Student: Calhoun continued to oppose the high tariff long after Jackson was out of office. That shows that opposition to Jackson wasn't the reason for Calhoun's stand on the tariff question. If it had been the reason, after Jackson left office Calhoun would have eased off on the tariff question. But he didn't.

Student: Did Calhoun change his mind on the tariff question before or after he broke with Jackson?

Teacher: He changed his mind before the break. Why do you ask?

Student: Well, if he changed his mind while he was still friendly with Jackson, then his quarrel with Jackson doesn't explain his change of mind.

Student: Did the South export more cotton in 1830 than in 1820?

Teacher: Yes, the South exported more cotton in 1830 than she did in 1820. What do you have in mind?

Student: If the South was exporting more cotton in 1830 than she was in 1820 then she would be more opposed to a high tariff in 1830 than she had been in 1820.

Teacher: Why?

From this point the discussion developed the proposition that due to changing economic conditions in the South, the Southern people were more opposed to a high tariff in 1830 than they had been in 1820. Hence, Calhoun as a representative of Southern interests changed his position on the question.

As the above discussion illustrates, students formulate hypotheses in a natural, spontaneous fashion when they are attempting to solve a problem which they have accepted. It will be noted that the great majority of hypotheses were advanced by the students rather than by the teacher. This procedure is highly desirable in order to guard against the creation of an artificial situation for the students, and it provides a maximum opportunity for the students to engage in the thinking process. However, it should not be inferred from this statement that the teacher should never offer hypotheses. Rather, the teacher should hold in reserve an abundant store of them and inject them into the discussion if and when they are needed to keep thought moving forward.

Similarly, in problem-solving, the students should furnish and apply most of the evidential material. But the teacher must assume the responsibility of making available a rich store of material from which the students select what is relevant. Occasionally "on the spot" information will be required in the problem-solving process and this the teacher should supply if possible.

Encouraging the Students to Discover Problems. While the method of presenting a problem illustrated in this transcription has the merit of directness and hence economy of time, it has the disadvantage of being "sprung" on the pupils. That is, while the problem is logically germane to the content, the students may not be sufficiently aware of the connection to "take on" the problem. Therefore, the teacher may find it to be more effective to allow the problem to emerge from the context of an exploratory discussion. In the illustration that follows, the problem which the teacher introduced at the outset of the previous transcript emerges from such an exchange.

Teacher: Was there anything in your lesson today that you did not understand?
(No response)

Teacher: No one is certain? Then, let us take a look at what was happening in the 1820's. What do you believe was the most important event in your lesson today?
(A pause, then several hands go up)

Student: The election of Jackson.

Teacher: Why?

Student: Well, because he was one of the strongest presidents we have ever had.

Student: I don't agree with that. Jackson was just a backwoodsman who made good as a military hero. He invented the spoils system.

Student: What's wrong with the spoils system? It's democratic, it allows more people to hold office.

Student: Yeah, it allows political hacks to hold office.

Student: I don't think that the election of Jackson, whether or not he was a good president, was the most important event. I think that the fight over the tariff was the most important.

Teacher: Why do you think so?

Student: Well, this was the start of trouble between the North and the South that led to the Civil War.

Teacher: Why did the North and the South disagree over tariff policy?

Student: The North had manufacturing and the South raised cotton. The North didn't want European manufactured goods to compete with their products. The South sold much of the cotton in England and bought its manufactured goods from England and the North. A high tariff would make the South pay more for manufactured goods.

Teacher: But, it seems to me that the South would benefit from a high tariff on cotton.

Student: If a high tariff would have helped the South, Calhoun wouldn't have been against it. I read a book about him. He was no fool.

Teacher: Did Calhoun oppose a high tariff policy?

Student: Sure he did. He led the fight against the Tariff of Abominations.

Teacher: Where was he from?

Student: South Carolina.

Student: Yes, and he continued to fight against a high tariff right up until he died in 1850.

Teacher: In the book you read about Calhoun, did it say what his views were on the tariff question before 1828, before the debate over the Tariff of Abominations?

Student: No, I don't think it did. But I suppose he was opposed to high tariff.

Teacher: As a matter of fact, he favored a high tariff policy from the time he became an official in the federal government up until the early 1820's. In 1816 he made a speech in the house in favor of a high tariff. How do you account for his change of mind?

In the above illustration, in addition to the problem actually used by the teacher, the following problems are stated or implied:

1. Does the exercise of the spoils system result in effective government?
2. Is the spoils system a manifestation of democratic government?
3. Were the causes of the Civil War basically economic in character?
4. Do military men make effective presidents?

As was the case in this instance, the teacher may not choose to deal with some problems at the time that they emerge. He may prefer to note them down at the close of the period on the chance that an opportunity might arise to consider them at a later time. Whether or not the teacher decides to deal with the problem when it is expressed or reserve consideration of it depends upon a number of factors:

1. Does the material under discussion offer data relevant to the problem?
2. Is the particular problem, in the teacher's judgment, more important than the problem that you have in mind?
3. Can interest in testing the problem be created later?
4. Can discussion of the problem that the teacher has in mind be postponed?

Converting the Unexamined Beliefs of Students into Problems. Students, in the process of growing up, take on a large number of unexamined, ungrounded beliefs. They acquire these beliefs from their parents, their brothers and sisters, age-mates, religious leaders, teachers, mass media of communication, and whatever other contacts they have with their society. These beliefs are accepted by students largely on the basis of authority. Students absorb their beliefs from their social environment. They are Republicans or Democrats because of the political affiliation of their parents. They believe in monogamy because it is generally accepted in our society as the ideal family organization. The list of unexamined beliefs held by students could be extended almost indefinitely.

The characteristic of student beliefs that we are interested in at this point is not whether they are true or false, good or bad. The fact that they are unexamined ones—that they are not grounded in relevant fact—is the important thing about them for our present purpose.

Knowing the unexamined beliefs that students have expressed, the teacher can bring content to bear upon them in a manner that will initially cast doubt upon their validity. Thus unexamined beliefs are converted into problems for students. In order to convert the unexamined belief into a problem the evidential material selected must sharply challenge the validity of the belief.

Once the doubt is created, once the problem has been formulated, then the students can be selectively immersed in content. Selective, in that the content must bear an evidential relationship to the problem. However, once the doubt is created, the criteria for selection of content is solely that it be relevant to the problem, that it test the belief; whether it supports or casts further doubt on the belief at this latter stage is no longer significant.

When the problem-solving process occurs within the above context it serves the purpose of converting unexamined beliefs into examined ones, of changing ungrounded beliefs into beliefs that are grounded in relevant fact. The student is called upon to test his beliefs and in so doing he is given command of a method of testing beliefs.

The following example may help to clarify the process by which student beliefs are transformed into student problems. Let us assume that a student, in the class discussion, expresses the belief that the Democratic Party has always favored the cause of organized labor. If this unexamined belief, which the student has "picked up" from his parents (as subsequent class discussion discloses), is to be converted into a problem, then the teacher must see to it that content that sharply calls the belief into question is introduced into the discussion. The teacher may himself interject such content or he may ask the class members if they can provide any data that would question the belief. In this instance, let us assume that either the teacher or a student interjects into the discussion President Cleveland's actions in relationship to the Pullman strike, thus introducing evidence which tends to question the validity of the belief. If the evidence does convert the unexamined belief into a problem, then the subsequent discussion takes the form of searching out data and applying these data to the problem. Relevant material would include such items as the Wagner Labor Act and Section VII of the N.I.R.A.

Pointing Up Conflicts Within the Students' Patterns of Beliefs, Thus Creating Problems. The fact that students have acquired their beliefs from a variety of sources within a pluralistic society frequently results in their adhering to two or more beliefs which conflict. Usually in such cases the student is unaware of the conflict. If the teacher elicits from the student two of these beliefs and brings them into sharp conflict in a specific situation, the student may be involved in a state of uncertainty and launched in the problem-solving process.

Once the conflict becomes clearly apparent to the pupil he may accept the resulting problem and thus become involved in problem-solving. It is always possible, however, that the student will not be disturbed by the inconsistency and in such cases the problem-solving context is absent. To proceed to the next stage in problem-solving in such cases only results in "fact" coverage for the student even though the context logically bears an evidential relationship to the problem.

The student, for example, during the study of Social Darwinism, may express the belief that a social policy designed to promote the survival of the fit is desirable.

Either prior to this time or at a time following the voicing of this belief the local community fund drive occurs. The local mass media of communication are solidly behind the drive. The student in question comes to class wearing the insignia of a contributor to the fund. When the teacher has ascertained that the student has in fact contributed and that he believes in the purposes of the fund, then the teacher is in a position to confront the student with the conflict in his pattern of beliefs by pointing out that many of the agencies supported by the fund are dedicated to keeping the unfit alive.

Pointing Up Conflicts Within the Course Content, Thus Creating Problems. Most textbooks contain inconsistencies and contradictory statements. The teacher can exploit these by pointing them up to the students. Once he has the students' attention to the contradiction or inconsistency, he may have involved them in a problem. If the existence of a contradictory or inconsistent situation troubles the students, then the teacher has "caught" them in a problem. If the situation does not trouble the students, then the teacher has not placed them in a situation that is psychologically a problem to them. If the students do accept the situation as a problem, then the teacher can proceed to expose them to an abundance of data. The textbook and numerous other collateral sources may be used. Data will be uncovered which may enable each student to resolve the contradiction or eliminate the inconsistency in his own mind.

For example, a textbook in *Problems of Democracy* may underwrite the position that the American economy functions best when the government refrains from intervening in private business. Yet in a later chapter the author may advocate a protective tariff policy and government subsidies for transportation of the mail. If the students are disturbed by this disjunction, then the teacher can launch them into an examination of it to clear up the situation. In the process of making sense out of the contradiction, the teacher could raise such questions as the following:

1. What is meant by government interference in business?
2. Does government financial aid to business constitute government intervention in the eyes of those who object to government intervention?
3. Do those who object to government intervention in business consider financial assistance, direct or indirect, as falling into this category?
4. Do those persons who object to government intervention as a general principle condone it in times of widespread financial crisis?

The Distinction Between Problem and Topic. Possibly we should consider briefly the misuse of the term *problem.* In textbooks and courses of study frequently topics are designated as problems. The following statements are examples of this practice.

> The problem of living in the Atomic Age.
>
> The problem of transportation in the Middle Ages.
>
> The problem of communication and Colonial America.
>
> The problem of the distribution of goods and services.

It is quite probable that problems are to be found in each of the above topics; but the topics themselves are not problems. As the teacher plans his lesson or in the course of class discussion, problems may emerge from such topics. When problems embedded in topics are identified then the class can become involved in problem-solving. However, if the teacher attempts directly to conduct problem-solving activities around a topic merely because it has been labeled a problem, the result is an unfocussed, disconnected, descriptive superficial coverage of content. No problem exists to which content can have an evidential relationship. However, if in the discussion of the topic, Living in the Atomic Age, a problem emerges such as "How can society prevent the international proliferation of the atomic bomb?", then problem-solving can go forward.

Creating an Intellectually Permissive Atmosphere

An intellectually permissive atmosphere is essential for a worthwhile discussion and an important factor in gaining maximum student participation in the discussion. All that is meant by the term "intellectually permissive atmosphere" is a classroom environment in which the students feel free to express their opinions, knowing that their opinions will be courteously, fairly entertained, but rigorously analyzed. If an idea expressed by a student is met with sarcasm, that student and probably others will hesitate to participate in class in the future. If the teacher indulges in personal attacks rather than in an examination of the ideas presented by the students, he will dry up the flow of honest discussion. This does not imply that the teacher should praise or accept without critical examination an inane, thoughtless, irrelevant or inappropriate comment of a student. The purpose of establishing a permissive atmosphere is to promote a worthwhile discussion, not to stimulate participation for the sake of participation. The point is that the teacher should see to it that the ideas expressed by students in the course of a problem-solving discussion are energetically, carefully, but fairly examined.

In the following excerpt from a class discussion the teacher destroys an intellectually permissive atmosphere, if, indeed, such an atmosphere existed.

Teacher: I think that you can see that the T.V.A. is an unnecessary burden on the taxpayers.

Student: But, I thought that the T.V.A. was self-supporting. Doesn't it sell power? I thought—

Teacher: (*Interrupts*) You are using the same argument that the socialists and other radicals use. You should favor free enterprise, Aren't you in favor of the American system?

Student: The book said that Congress passed the law creating the T.V.A. Isn't that according to the American system?

Teacher: I wish you would think before you speak. You are always blurting out something before you stop to think.

Student: I think that Herbert Hoover was wrong when he opposed government power projects.

Teacher: Well! It's nice to know that we have a utilities expert in the class, a young genius that knows more than one of our distinguished presidents. Does anyone else have anything to say about the T.V.A.? (*No response*) I don't know why you people are so closemouthed. Haven't you studied your lesson? Doesn't anyone have anything to say about the T.V.A.? All right, let's go on to the next topic.

As the above illustration suggests, the teacher cannot create or maintain an intellectually permissive atmosphere if he attempts to inculcate a particular point of view. In fact, the two goals are diametrically opposed.

The first word in the term "intellectually permissive" must not be neglected. If such a neglect occurs, the result is an attitude of "anything goes." On the intellectual side, permissiveness becomes the right to express irrelevancies and blind prejudices. On the physical side, permissiveness is equated with horseplay, rudeness, disorder—a general state of bedlam. However, when the two words in the term receive equal emphasis, pupils are required to be intellectually responsible and socially civilized.

The teacher will have some students who are reluctant to express their ideas in the classroom. This reluctance may be due to any one of a variety of reasons. The student may have been "cut down" by a teacher as in the above illustration. He may lack confidence in the worth of his opinions. By carefully, but unobtrusively, watching the facial expressions of pupils during the course of the discussion, often the teacher can detect a student whose expression suggests a half-willingness on his part to enter into the discussion. His eyes reveal a sparkle of interest and his frown bespeaks an unasked question or an unvoiced objection, or confirmation of a point just made by another student. Yet the student's habit of refraining from entering into a problem-solving discussion is sufficiently compelling to prevent him from voluntarily participating. If, at this point—the point of apparent high interest—the teacher invites the student to react in a relaxed fashion the probability is good that the student will participate. Once he has contributed to the discussion, once the ice is broken, the chance is good that he will participate in future problem-solving discussions.

With some classes the teacher may find it difficult to establish rapport—the class remains "frozen." Problems which other classes attack with enthusiasm, this class views with indifference. The "way of life" in this particular class is truculent silence. A promising way of breaking through this laconic wall of silence is to sacrifice the attempt to achieve high level problem-solving discussions for the present and center on the immediate interest of the students. That is, the teacher can turn from an attempt to engender discussion around vital, but abstract problems, to more specific, current, though less significant problems. The teacher may be able to arouse discussion, for example, around a local robbery where he has been unsuccessful in engendering discussion concerning a summit meeting of the major world powers.

Once the teacher has established an atmosphere of free, uninhibited discussion, then he can gradually proceed to a consideration of more vital, substantial problems. Indeed, often the teacher can use the immediate, limited situation as the starting point for a transition stage to a consideration of a vital problem involving the wider culture. A discussion of a local robbery, for example, may involve the problem of how to achieve and maintain order and protection of life and property in the local community. From this point the teacher may be able to shift the discussion to the world scene and the similar problems facing the world powers.

Problem-Solving and Values

Much confusion, frustration, and indoctrination can be avoided in class discussions if the teacher—and eventually the student—have a clear understanding of the relationship which exists between the process of reflection and the realm of values.

The reflective problem-solving process operates both in dealing with problems of fact and problems of value, but in different ways. The failure to recognize this distinction is a basic cause of the ineffective use of the problem-solving process. When the problem-solving process is used in a manner appropriate for dealing with a factual problem in a context in which a value question is involved, the result is the breakdown of the reflective process. Likewise, when the converse misapplication occurs, reflection fails to perform its function.

For example, in a senior high school class the following question arises, "Should we declare war on Communist China?". In the course of the discussion the point is made and conceded that this could bring Russia to the defense of China. With Russia's capacity for waging war, this could result in devastation to our country. At this point a student asserts that he would rather be dead than Red. Another student counters with the statement that he would rather be Red than dead. The teacher then asks the class to determine reflectively which student is right.

In effect, one student has said that his ultimate value, in this situation, is to die rather than accept the alternative of living in a communistic system. The other student has expressed as his ultimate value the desire to live regardless of the conditions of life. Now in such a situation reflection can make clear what is at stake; it can clarify the consequences flowing from particular choices and may uncover additional possible choices. One or both of the students may discover that the value expressed is an instrumental rather than an ultimate value. This latter possibility will be discussed further, but let me emphasize that the reflective process cannot decide matters of ultimate value. Both students can agree that a declaration of war on Communist China would result in major destruction to the United States, arriving at that insight reflectively, yet they can continue to disagree over the value to be sought and hence they will disagree on the course of action to be adopted.

When it becomes clear in a class discussion that what is involved is the selection of ultimate (end) values, it becomes important at this point that the teacher use reflection to clarify the consequences of the possible choices (values) and to uncover additional choices. When the teacher in dealing with a discussion involving end values treats the situation as if instrumental values or factual assertions were under consideration, he creates a situation in which reflection is inoperative. For reflection cannot determine the *right* where *right* is an ultimate value.

If the teacher treats a problem involving ultimate values as if it were one in which instrumental values were under consideration often indoctrination is the outcome—indoctrination made more effective in that it occurs under the guise of reflection. Returning to the illustration, the teacher may conclude the discussion with the statement, "Now that we have thoroughly examined the problem you can clearly see that to go to war with Communist China would result in catastrophic destruction and we wouldn't want that. Therefore, we see that we must avoid such a war." In this case the teacher assumes the "correct" ultimate value and makes the leap from a reflective consideration of alternatives to sanctioning one of two ultimate values.

When values emerge in a problem-solving context, usually the value involved is an instrumental one. When this is the case the situation can be handled in the same manner as when strictly factual matters are at stake. The instrumental value either is or is not a means to the end sought. The determination of the question is open to reflective examination. If the student, for example, says that racially mixed marriages are wrong he may, of course, be stating what for him is an ultimate value. It is more likely that the student has expressed an instrumental value. In the course of the subsequent discussion he may disclose that he opposes mixed marriages because the divorce rate is higher among marriages in this category than among non-mixed marriages. In this instance the student's ultimate value may be associated with the divorce question and his stand on mixed marriages may be an instrumental value. If this is the case, then, the mixed marriage statement can be dealt with on the basis of relevant fact. The divorce rate in the two categories can be checked.

It is true that most value statements encountered in problem-solving will either initially or during the course of the discussion prove to be instrumental in nature. Yet frequently the value involved is an ultimate value, and, in fact, all situations can be pursued far enough to drive the discussion back to an ultimate value. Therefore, while much of the time classroom discussion will involve instrumental values which can be reflectively tested, this should not obscure the fact that ultimate values will be encountered and that such values cannot be reflectively tested.

There is, of course, a third category of problems;

namely, those problems which do not directly involve values. Problems of this nature include such examples as the following: Do armament races lead to war? Under what conditions, if any, does a tax increase lead to deflation? Does an increase in the well-being of a suppressed class lead to revolution? These are problems involving alleged relationships between concepts or events. In problems of this type evidential relationships can be established. In other words, such problems can be solved reflectively. Such problems, assuming the data are available, can be solved in a public manner. Such problems can be dealt with in a manner which allows all persons, who are willing to examine the evidence and base their conclusions on the evidence, to arrive at the same conclusion.

Removing Emotional Blocks to Problem-Solving

Capturing the student's interest in the content to be learned enhances the possibility that learning will take place. The greater the degree or intensity of interest the greater the quantity and the better the quality of thought generated in the student. The active engagement of the student's mind in content is essential to intellectual growth; he must care deeply about the content if his exposure to it is to result in conceptual learning. Therefore, it is important that content be selected that is likely to elicit intensity of interest.

It is for this reason that the area of current events offers promising material for promoting intellectual development. The current nature of the content means that it can be shown to have a direct or indirect impact on the student. Furthermore, the inconclusive state of much of the content presents a rich array of problems, any one of which the student may accept.

If student interest is used to generate a critical, reflective examination of some aspect of the current scene then the student will acquire knowledge, warranted conclusions, and skill in the method of arriving at knowledge. If attention is focused on concept formation, problem-solving, and the testing of the generalizations, then teaching current events will provide intellectual growth.

From what has been said, the teacher who calls forth a high degree of interest while centering on the current scene should provoke a thoughtful discussion. Yet this is not always the case. In fact, quite the contrary may occur. The higher the degree of interest, the lower the amount and quality of reflective thought, if a certain set of conditions prevails. If the pupil is involved in the subject he can become emotionally blocked. He may be unable to consider evidence rationally. If a large percentage of the class members suffer from this condition at the same time the atmosphere in the classroom may be one of, "I don't care what you say, I know." This, of course, means that for the students so affected, facts cannot be treated in an evidential relationship.

Thus the teacher faces the paradoxical situation of an intense degree of student interest but little or no critical thought going forward. Each student holds a firmly fixed belief and is eager to express it. The belief likely is ungrounded in relevant facts and, what is more significant, the student has no intention of exposing it to evidence that would call it into question. He cherishes the belief and holds it immune to investigation. He waits impatiently for another student to stop talking (in reality the other student is only making noise) so that he can enunciate "The Truth." Name-calling often is the order of battle. Volume of utterance rather than cogency of expression is relied upon to carry the day. Interest, yes; but thought, no.

What can be done to correct the situation? What can be done to transform a chaotic display of ignorant opinion into a reflective examination of an important current event? Moralizing to the students will not rectify the condition. Nor will lecturing them on manners be effective. What then has a chance of bringing the students to a rational examination of the subject?

One technique that sometimes proves to be effective, especially if the group involved is a history class, is the following. When the emotional block occurs the subject may be dropped for the time being. The teacher can return to a consideration of the historical content. In subsequent class sessions the teacher can watch for historical content from which a generalization may emerge which is applicable to the current event context in which the emotional block occurred. It should be noted that the teacher is asking the students to consider a generalization within subject matter removed from them in time and place. They are not directly involved nor are their families. Having clarified and tested the generalization within the historical setting, the teacher may then introduce it into the current event context which originally resulted in the emotional blockage.

At this point the students again may react irrationally, but having succeeded in getting them to examine the generalization in a context removed from the current milieu there is a good chance that now they will entertain it thoughtfully as it is applied to the current event.

Possibly an example is in order. Let us assume that a family moves into the community and enrolls their child in school. Let us assume further that the Pledge of Allegiance is included in the homeroom activities. The new student states that he cannot salute the flag on religious grounds. The incident is discussed over the dinner table in many of the homes in the community that evening.

The next day in a history class (which did not include the student in question) the teacher, capitalizing on the interest generated by the flag salute incident, attempts to raise questions concerning civil liberties. The ensuing discussion is irrational, dogmatic, and boisterous. Preconceived opinions are expressed with little or no attempt to consider evidence. After this has gone on for several minutes the teacher may call a halt to the proceedings and turn to another topic.

Returning to the content of world history, in subsequent class periods the teacher waits for the occasion when the content under consideration presents a parallel to the flag salute incident—a parallel in the sense that a generalization can be formulated from the historical context which can then be transposed into the situation out of which the emotional block occurred.

In studying the Spanish Inquisition (or the Wars of Religion) including the expulsion of the Moors and the Jews, the following generalization emerges: When the majority within a country persecutes citizens for religious reasons, it detracts from the economic strength of the country. After examining this generalization in the Spanish context, then the teacher brings the generalization into the flag salute incident.

At this point the students again may react in an emotional, irrational manner to the problem. There is a chance, however, that the students, once having committed themselves to a reflective examination of the problem in a setting removed from them in time and place, will test the generalization in the context in which originally they were unable or unwilling to operate in a rational fashion.

This teaching strategy points up an important factor of timing relevant to problem-solving. In the situation described above (and indeed, in any situation where problem-solving tends to break down for whatever reason) creating a time lapse before a reconsideration of the problem has merit. It has merit for the following reason: If the problem has been clearly fixed, and if sufficient discussion has occurred before the class thinking "bogs down," then discontinuing the discussion allows the students time to mull over the problem. The students thus have time to play with the problem, looking at it in a variety of lights, combining its elements in different ways and bringing fresh elements to bear upon it. This consideration of the problem, both on the conscious and the subconscious or subliminal level, frequently means that when the problem is reopened for examination new insights are brought to bear and the problem-solving process is completed on a very intellectually satisfying level.

Another strategy that holds promise of removing the emotional block is one that is particularly effective with senior high school students. Students at this stage in their development are seeking identity, are striving for adult status and are breaking parental ties.

When an emotional block occurs in the classroom discussion, the teacher allows the irrational exchange of the students to continue for several minutes. Then he calls a halt to the discussion. He asks them to consider the import of what has just taken place. He raises such questions as the following. Does it signify that they are incapable of carrying on sustained, objective, reflective thought? Does their behavior signify that those adults who claim that high school students are too immature to think for themselves are correct?

Usually this strategy focuses class discussion on the meaning of their recent behavior. Frequently they contend that their irrational reactions represented a momentary slip, not characteristic of their usual behavior in the class. In most instances they conclude with a plea to be allowed to return to a consideration of the problem which sparked the irrational outburst. When allowed to do so, usually they succeed in engaging in a reflective consideration with only momentary slips into irrational expression but with a certain constraint because of consciously exercised self-control.

The Social Studies Curriculum

From what has been presented in prior sections of this chapter it should be apparent that any social studies content can serve as the base for the problem-solving approach. Problems can be generated from any social studies context. Therefore, the teacher can use the problems approach within the confines of his present curriculum.

However, in order to achieve to a maximum degree the outcomes set forth in this chapter a reorganization of the social studies curriculum is needed. The guidelines for this reorganization emerge from the purposes sought through problem-solving.

The problems included in the curriculum should be deep-seated and those that thwart the realization of man's human potential. Problems of this type can be identified by focusing on the effects of the major social forces that have brought the modern Western world into being. I refer to such phenomena as industrialization, technology, urbanization, democracy, individualism, political centralization, the method of science, bureaucratization, and specialization. Once these social forces have been identified (each teacher or group of teachers will arrive at a somewhat different list), the curriculum builder looks to the effects of these forces individually and in various combinations on modern society. Here are discovered the major problems of our society. For example, political centralization has led to a feeling of civic powerlessness on the part of average citizens. Industrialization, specialization, and technology have created slums, impersonal human relationships, job monotony, and technological unemployment.

Once the problems have been identified they can be assigned to grade levels based on considerations of the maturity of students. In some instances a problem may be treated at two or more grade levels. In such cases at the more advanced levels the problem should be dealt with in greater depth and broader scope, using concepts at a higher level of abstraction. The resulting curriculum, dealing with broadly-based social problems, will of necessity be interdisciplinary. Furthermore, the curriculum will contain a strong historical dimension since the roots of each problem will need to be investigated as the student traces the emergence of the problem. The focus of the curriculum, however, will be the current social system.

Evaluation

There is a sense in which teaching and evaluation are the same act viewed in different perspective. In the act of teaching the teacher evaluates the responses of the student. Indeed, even in lecturing the teacher has the opportunity to evalute student response. In such a context the teacher can note facial expressions which reveal insights. Class discussions, to a much greater degree, provide the teacher opportunity to gain insight into the students' ability to solve problems. Individual and small group conferences centered around collateral reading afford the teacher a fruitful context for judging the quality of the students' problem-solving skills. In fact, the teaching strategies that are most promising for developing the students' abilities in problem-solving also create the best context in which to assess his ability in this regard.

The teacher, from the point of view of evaluation, may find it helpful to keep an anecdotal record of the insights which he gains from his teaching concerning individual students.

Conversely, the pencil and paper tests that best measure problem-solving ability also develop the capacity of the student in this area. Thus, skillfully constructed essay tests which pose problems both measure the students' problem-solving skills and at the same time extend the students' abilities.

Practical Limitations of the Problem-Solving Process

In the senior high school social studies program the student should be made aware of the practical limitations of the problem-solving approach. He must come to realize that he will encounter situations in which the facts relevant to his problem are not available. It may be that he does not have access to the data. Often problems lodged in recent history fall into this category. He may, for example, wish to know whether the Russian decision to withdraw the Cuban missiles was Khrushchev's decision alone. Since relevant information in the Russian archives is not available, the student cannot solve the problem. The teacher can use such student experiences (indeed, he can plan that the student will have such experiences) to make the student realize the need to suspend judgment when the evidence is unavailable.

Another practical limitation of the problem-solving approach is the situation in which the student must act, must come to a decision, prior to the time when the evidence is obtainable. For example, the student must decide which of two summer jobs to accept when many of the facts relevant to his decision can only be obtained by working on the job. The student must act when he does not have sufficient evidence upon which to draw a conclusion.

Often, ironically, the student fails to gain these two insights—the need of suspended judgment and the need to act upon insufficient data—because the teacher is skillful in creating situations where problem-solving can go forward with maximum effectiveness. That is, the teacher selects problems for student consideration for which sufficient data are available and the time element is not a factor. The teacher includes in his list of criteria for selecting problems for student consideration the availability of data and their availability prior to the time the decision must be made. These are the very factors which prevent the student from encountering the practical limitations of the problem-solving approach.

Intellectualizing the Problem-Solving Process

At some point in the social studies curriculum of the senior high school the students should be asked to intellectualize the problem-solving process. They should be given the opportunity to critically examine the implications of commitment to the reflective process to themselves and to their society. They should come to see that reflection is one among several roads which they can travel in arriving at conclusions. They should be made aware that men have relied on divine revelation, sheer intuition, authority, tradition, magic and other non-reflective sources in arriving at answers. They should discover what differences it makes for them and for their society when one route is chosen rather than another. They should become aware that it is possible to compartmentalize one's life, relying on the reflective process in certain areas of life, while resorting to one or more of the other avenues to answers in other areas. Further, they should examine the consequences which flow from such compartmentalization.

For to remain true to the spirit of reflection, the teacher must not only develop the capacity of the student to reflect, but, equally important, the student must come to know what is at stake in making the choice to use reflection in problem-solving. To stop short of requiring the student to intellectualize the problem-solving process is to indoctrinate. To stop short of requiring an examination of the consequences of choosing reflection, thus placing reflection in jeopardy, is to violate the very tenets of the position. Of course, in one sense, indoctrination is still present for the teacher is requiring the pupil to use the reflective process, not some other means of arriving at decisions, to make the decision to accept or reject the problem-solving process. This much indoctrination is an inevitable element.

Chapter 5

Current Trends in Problem Solving

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The concept of what is involved in the problem solving process has undergone dramatic change since this volume was first issued. The use of electronic computers, new developments in the behavioral sciences, and major advances in research on human learning all combine to offer the investigator an extended arsenal of ideas.

This chapter will attempt to review the basic ideas which presently shape the theory of problem solving and to search for connections between this theory and current instructional practice. Specifically, Part I will review several developments in behavioral science theory having to do with the solving of problems; Part II will set forth recent learning theory which bears on problem solving skills; and Part III will examine the extent to which these exciting developments in theory have found expression in classroom practice.

PART I. Behavioral Science Theory

Present-day thinking about problem solving is being shaped to some extent by the development of various inter-disciplinary theories. Several of these cross-disciplinary formulations are highly relevant to our consideration of problem solving in the social studies classroom. Among these are cybernetics and general systems theory—probably the broadest in scope and general applicability—information theory, pattern recognition theory, decision theory, and game theory.

The major focus of *cybernetics* rests upon the concept of feedback. The idea of the feedback loop is the device by which the cyberneticists explain the purposive and adaptive behavior which we look for in a problem solver. The feedback concept centers around the idea of testing behavior against the attainment of a particular goal. Feedback is information gained about whether or not a course of action is proving effective in moving the actor closer to the goal he has set. It may serve a validating function, in the sense of indicating that one is "on target" or moving in the desired direction. On the other hand, feedback may convey information that one is "off course," and that a change of plan or action is in order. When we use the cybernetic concept of feedback to understand and explain problem solving behavior, we say that we are taking the following steps: (1) we analyze a problem situation by comparing it with a goal situation; (2) we take an action designed to change the problem situation; (3) we conduct an intentional search for information (feedback) as to the effectiveness of the action. This feedback will tell us the degree to which the problem situation has become more like the goal situation. (4) Our next action will be designed in the light of this new information.

While cybernetic theory has offered some formulations that have been very helpful in thinking about problem solving, it may well develop that the perspective of *general systems theory* (James Miller) will prove more fruitful in the germination of problem-solving theory. The identification and analysis of systems allows, and even requires, a degree of initial simplification. As with the development of any model, the identification of a system requires that we intentionally ignore many features in the situation under consideration. Although the delimitation of a system may be a fairly arbitrary matter, the concept will always include a goal, purpose or function that is served, and components that are interacting. Systems may be identified at any level of social organization or at any point in time. Examples might be a restaurant, a national legislative body, or a transcontinental bus together with its driver and passengers. Any of these could be described, analyzed, and evaluated within the framework of general systems theory. Accompanying the development of this body of theory has been the use of a precise and operational language.

The major vehicle of development in general systems theory has been the construction of *models*. The word implies that for a given problem an attempt is made to reproduce or to simulate in a schematic and simplified way the problem situation, retaining only those variables and conditions which are relevant to the problem, and overlooking all other details. To the extent that the model does accurately simulate those aspects of the real world which are germane to the problem at hand, the results obtained from study of the model can be translated into corresponding statements about reality and into predictions about which courses of action might produce a solution. The development of a model stands as central to the procedure of all the bodies of theory which are being discussed in this section. Emphasis on model construction and simulation techniques are among the significant changes in the approach of behavioral scientists to the social world.

One of the most productive "models" of cognition theorists has been that model which offers a view of man as an information processing system. This is the model basic to *information theory,* and is the portion of that theory related to the concerns of this chapter. With the abandonment of any belief in fixed intelligence (Piaget; Bruner; Hunt), cognition and information theorists are using a new model of intelligence. This model depicts intelligence as a hierarchy of strategies for processing information and of schemata for assigning significance to this information. This view of man as a processor of information has provoked learning theorists to ask different kinds of questions about how people solve problems, make decisions, and think creatively. (Newell, Shaw, and Simon, 1958.) The model of man as an information processing system focuses attention on processes, and requires a rigorous identification of the stages (heretofore hazily described) through which man moves in his cognition of the environment. An important distinction has been made, under the aegis of information theory, between two types of problem solving procedures, the *algorithm* and the *heuristic.* Briefly the difference can be explained as follows: an algorithm is a procedure for solving problems, a formula, which, if followed accurately, guarantees a type of solution to that problem. For example, cooking recipes and formulas for computing compound interest are algorithmic in nature—they are fairly rigid rules of procedure in which the user merely "plugs in" the ingredients called for. In the social world, ritualistic kinds of behavior might be considered algorithmic in nature. It might be said that some primitive societies with monolithic value patterns are more algorithmic than others. In our own society, the social behavior of those individuals having very rigid behavior patterns, who meet virtually every social situation in the same way, might be described as more algorithmic in behavior than that of others. An heuristic, far from being a recipe for the solution of a specific problem, offers a general rather than specific stratagem or style of attack for a problem.

Much of the early research in problem solving dealt with algorithmic approaches. It is now held by some theorists that, with the possible exception of habit patterns (in which case we are dealing with problems of which we are not generally aware), algorithmic approaches to a problem are of doubtful assistance in our encounter with the social world. The literature of professional education which deals with the issue of learning to be a problem solver has virtually ignored a fact which becomes fairly obvious when one looks at the same issue from the information theory perspective: the strategy of learning an algorithm and that of developing an heuristic are altogether different learning tasks.

Central to information theory is the concept of *uncertainty.* "Uncertainty" refers to the number of possible alternatives contained in a situation, and is reduced by gradually eliminating most of these alternatives. *Information,* then, is measured in terms of the degree to which it removes or reduces uncertainty. The fewer the number of alternatives included in a message, the greater the amount of information this message carries. For example, a message directing a driver to turn at an intersection contains less information than a message to the effect that he should make *a* left turn. The process of problem solving may, of course, be viewed in this identical light: as the gradual reduction of alternatives by means of data-intake and information processing.

The theory of *pattern recognition* (Selfridge and Neisser) is closely allied to the information theory model. The principal function of pattern recognition is the reduction, the abstraction, of complex environments. This reduction and simplification is not dissimilar from the construction of a model and is basic to problem solving activity. A major theme in all of the work on pattern recognition is the consideration that not even a computer, to say nothing of a human being, can afford to deal with each event in the environment as a special and unique case. Man is constantly exposed to a welter of data and he must abstract patterns from these data which relate to his activities at the moment. His ability to solve problems, to make creative decisions, and generally run his life, depends upon the skill and accuracy with which he conducts this procedure of abstraction. Within the framework of this perspective it is possible to view each of us as characterized by a set of pattern classes or categories into which we process the on-going data of our lives. It is the product of this classification, rather than the "raw data," which serves as the basis of our problem solving behavior. It seems likely that these pattern categories determine the very nature of our problem sensitivity and the way in which we will define a problem.

A fifth body of cross-disciplinary formulation important to problem solving is *decision theory*. Again we find that the digital computer has made possible the simulation of exceedingly complex human decision processes for the purpose of analyzing and testing hypotheses about decision-making behavior. Decision theory outlines the essential variables and essential information necessary for the making of a decision. Generally, these are: (1) the stimulus variables in the problem, (2) the response or action alternatives, (3) goal conditions: the goal variables as well as the relative priorities of goals, (4) implications of the exercise of response alternatives, (5) rules of strategy for selecting alternatives in order to optimize goal conditions in any given stimulus or problem situation. As we have noted before, the style of analysis and the explication of thought components of this approach are promisingly productive for educators.

The thoughtful reader will see immediately that any discussion of decision theory is certainly not the whole of the procedure we recognize as problem solving. Indeed, it may represent that part of the procedure about which we as educators need to be least concerned. Decision theorists concern themselves, by and large, with the process of selecting a course of action from among alternatives already identified. Problem solving, by contrast, frequently requires improvisation of alternatives beyond those already known to the problem solver. In real life situations, problem solving alternatives are not given, but must be sought or created. This is Simon's (1959) meaning when he says that in order to understand problem solving we need more than a description of the process by which choices are made.

Simplistically speaking, problem solving includes four more or less distinct tasks:

1. Recognition and definition of the problem
2. Generation and identification of all possible alternative courses of action
3. Consideration of these alternatives in the light of consequences of each
4. The choice of one action alternative by means of comparatively evaluating each set of consequences.

Now we all know that actual behavior seldom follows this pattern. We would question whether it is ever possible for an individual to know all of his alternatives or all of the consequences of any of these alternatives. Further: decision making can rarely be said to be a fully objective procedure since impinging on every decision are some perceptual biases and some system of valuing.

In thinking about how one learns problem solving skills, it may be helpful to exaggerate the distinction among the four component processes or task categories mentioned above. Curricular attack on these tasks awaits answers to the questions: Do the different task categories require different types of intellectual performance? If yes, what cognitive behaviors describe the fulfillment of each task category? There exists, in much of the problem solving literature, the implied assumption that an individual skilled in the performance of one of these tasks will also be characterized by equivalent skill in the others. The author knows of no research supporting this assumption. Indeed, it seems the field would be richly served by research which makes the effort to concentrate on these components singly.

Game theory is the study of decision making in conflict situations. Because the central interest of game theorists lies in decision making at the point of social conflict, much of their thinking seems relevant to a consideration of problem solving approaches in the social studies.

The type of conflict situation of interest to the game theorist parallels in many ways the situational conflicts which often serve as the focus of social studies discussions. These are conflict situations encountered historically and currently by individuals, by family groups, special interest groups, by nations or by groups of nations. They parallel the interests of game theorists in these ways: first, the participants (those making the decisions or selecting the course of action) do not enjoy complete control of the situation; and, second, the interests of all participants can seldom be satisfied in the same degree.

In game theory formulation, the decision comprises a selection of one among several strategies. A *strategy*, in checkers, diplomacy, business, or war, may be defined as a "general plan of action containing instructions as to what to do in every contingency." (Shubik, p. 13.)

Basically, the game theorist asks five questions:

1. What strategies are available to you?
2. What strategies are available to an opponent?
3. What is the outcome of a whole series of pairings of strategies?
4. What value do you place on various outcomes?
5. What value does your opponent place on these outcomes?

The five questions can, of course, be applied explicitly only after the realization of two underlying assumptions. It is assumed that the problem confronting the decision maker can be so clearly defined that all possible action alternatives may be itemized. In any complex social situation the possibility of so completely itemizing alternatives is seldom, if ever, realized. The second assumption offers an even greater roadblock to the whole-cloth transfer of game theory to social decisions; that is the assumption that payoff values and probabilities can be measured.

At the time of this writing, game theory seems to be undergoing a type of reappraisal by mathematicians, political scientists, and learning theorists as well as by game theorists themselves. One obvious advantage of training in "strategic thinking" is that one learns to look at both sides of a contest and to take into account the options and capabilities of an opponent. On the other hand, strategic appraisal imposes current values and objectives on a situation and holds these as constants. It does not allow for gain of critical insight into these values and for the possibility of value-change as a result of this insight. (Rapoport, 1964.)

In addition, game theory disregards the evidence that most contests in the past have not ended in clear-cut victory for either side. Learning theorists have tended to deny game theory as a description of human behavior (Suppes and Atkinson), and view it instead as a prescription of how a rational player should behave. It is probably only in this latter way that it may prove of some use to social studies teachers.

Specific uses of games in the social studies classroom will be examined at a later point in this chapter. It might be well to summarize here some benefits accruing to the student from exposure to and training in this style of thought.

Game theory is, as is any model, a device for simplifying and analyzing the complex. It allows us to concentrate on those aspects of a conflict situation which are truly crucial. It is a *way of thinking about conflict and decision making* and, in some instances, may serve to identify optimum strategies of solution. Aside from the fact that the use of a simplified model can frequently serve to isolate crucial factors, it is the conviction of some game and decision theorists that the formalization of a decision situation sometimes uncovers the "real" issue (Snyder). Game theory may offer additional conceptual aids in the form of training for precision, explicitness, and skill in bringing to the surface underlying patterns of relationships.

The educator will recognize that—insofar as actual classroom outcomes are concerned—the possible benefits of providing students experience with game theory are yet in the hypothetical stage. There is a rapidly growing body of evaluative research exploring the advantage to social studies students of training by means of games and simulation (Abt, 1970; Boocock and Schild, 1967; Guetzkow, 1962; Sprague and Shirts, 1966). Generally, the hypothesized claims for such training lie in the identification of the bare-bones essentials of a conflict situation, in gaining practice and skill in considering all sides of a contest, and in the recognition and assessment of alternative strategies.

PART II. Theories of Learning Related to Problem Solving

Problem solving theory itself has taken on a "new look" in the past few years. The changing concept of intelligence is primarily responsible for this alteration of problem solving theory.

The major revisionist view of human intellect uses as its analogue the way in which computers take in and use information. The model consists, roughly, of two parts: the storage of symbolic representations of concepts, arranged in a manner that will facilitate rapid retrieval, and a repertoire of strategies for data intake and information processing. Current theorists hold that the components of intelligence are derived from experience; that intelligence is a product of experience, and that it makes little sense to give any consideration to intelligence as separate from its experiential context.

Recent conceptions of the problem solving process are based on the view that functional intelligence changes continually as the result of the intellect's interaction with the environment. This dynamic view of intelligence holds exciting implications for learning a problem solving procedure: there is nothing inherent in this model which prevents any human being from acquiring a basic repertoire of problem solving strategies.

Among recent theories treating problem solving behavior, six give promise of shaping the curriculum and teaching practices of the future. These are the theories of Piaget, Pribram, Guilford, Suchman, Bruner, and Gagne. We will review these six approaches here and also look at the work done in the field of heuristics.

Jean Piaget

A monumental contribution to developmental psychology has come from the Rousseau Institute in Geneva, Switzerland, where Piaget and his colleagues have identified four stages of intellectual maturation through which they believe a child passes as he grows toward maturity. These stages could be viewed as four types of logic used by children, at succeeding ages, to confront problem situations. Piaget thinks of intelligence as a type of adaptation to life, stemming from one continuous interaction between the organism and the environment. (Inhelder and Piaget.) Two major themes of Piaget's work seem worth our special consideration here. They relate to the question: What guides are there for the complexity of the examples or exercises used to help students learn problem solving procedures?

The first theme treats the evolutionary nature of intelligence. That is, Piaget identifies four stages in intellectual development.

> The *sensorimotor* period predominates in the first 8 to 24 months of an infant's life.
>
> The *pre-operational* period includes the years between 2 and 7.
>
> The *concrete operational* stage lasts until 11 or 12 years of age; during this time a child needs to manipulate objects in order to arrive at a problem solution.
>
> The period of *formal operations*, when the child begins to master the skills of abstract reasoning, is usually completed by age 15 or 16.

While the order of these developmental phases is unchanging, there is probably some variation in the amount of time any one child requires to complete a single period. Of special importance to educators in this theory is the implicit suggestion of the type of problem complexity and conceptual content a youngster can manage at a particular stage of development. It would be useless, for example, to ask a child who is operating primarily at the concrete level to attempt to solve a problem requiring a degree of abstract reasoning.

A second theme developed by Piaget concerns the way in which an individual continually interacts with his environment. This interaction is carried out by two functions, *assimilation* and *accommodation*. Assimilation occurs when an individual confronts a new and strange object or event and perceives it in terms of something already familiar to him, thereby imposing on it a light of familiarity. Assimilation also occurs when an individual reacts to a new, strange situation with a "whole cloth" transfer of behavior learned in previous, though not necessarily similar, situations. On the other hand, accommodation occurs when circumstances are so different from those previously encountered as to demand a change in the person's conceptual schema and style of coping. All of Piaget's work emphasizes the concept of intelligence as a continually changing phenomenon, this change resulting from a person's encounter with his environment and this encounter being characterized by alternating acts of accommodation and assimilation. (Hunt, p. 247.)

Karl Pribram

Pribram and his colleagues have developed, from the field of neuropsychology, a behavioral theory of problem solving which so challenges the traditional concept of stimulus-response theory as to make the S-R formula either archaic or in need of drastic redefinition. (Miller, Galanter, and Pribram.) Together with Piaget and other cognition theorists, they view intelligence as a repertoire of strategies for processing information. Pribram's theory of human behavior is developed around the idea that the fundamental building block of the nervous system is the feedback loop. In place of the S-R description of behavior, Pribram poses the Test-Operate-Test-Exit (TOTE) unit hypothesis.

This TOTE unit describes the behavior of an organism when it perceives an incongruity in its environment: "The general pattern of reflex action . . . is to test the input energies against some criteria established in the organism, to respond if the result of the test is to show an incongruity, and to continue to respond until the incongruity vanishes at which time the reflex is terminated." (Miller *et al.*, p. 26.)

The test phase of the TOTE unit involves the comparison of the present condition with the goal condition, and the assessment of difference between these states. The operational phase includes actions taken to bring the present state closer to the goal condition. "We think of a test phase and an operational phase alternating until the operations turn up something that passes the test. Solving a problem is a matter of turning up a lot of likely hypotheses until either one satisfies the test or the stop-rule is applied." (Miller *et al.*, p. 168.) It is probably unnecessary to remind the reader that this Test-Operate-Test-Exit sequence operates after the fashion of an analogue computer.

Merrifield and Guilford

A problem situation, as defined by Merrifield and Guilford *et al.* (1962), is one in which initial information is given and a goal more or less specified but the relationships between the "given" and the goal are not apparent. This modified theory of problem solving involves five phases:

1. *Preparation*, in which the problem arises and is recognized as being a problem.
2. *Analysis*, involving the assessment of data describing the present situation as well as the goal situation. In assessing the present situation the problem solver deals with whatever data are available, but in assessing the goal situation he processes infor-

mation concerning antecedents necessary to attain that goal. The assessment of goal-relevant data results in the formulation of a "search model," a clarification of goal conditions.

3. *Production,* or the generation of alternative solutions, involves the clarification of better definitions of both the problem situation and the goal. Alternative outcomes are compared with the search model and a tentative solution is selected from these comparisons.
4. *Verification.* The problem solver may identify a successful solution, one which satisfies the demands of his search model, and count the solution process complete. If the tentative solution is rejected, however, the solver enters the fifth phase.
5. *Reapplication.* The problem solver returns to the previous stages with the intent of selecting and testing another tentative solution.

Guided by his theory, Guilford tested the hypothesis that six component skills are especially facilitative to problem solving. These skills are:

1. The ability to think rapidly of several attributes for characteristics of a given object.
2. The ability to classify objects or ideas.
3. The ability to find different relationships between attributes of an object.
4. The ability to think of alternative outcomes of a given situation.
5. The ability to list attributes of the specified goal or desired situation.
6. The ability to educe logically sufficient antecedents to a specified situation.

Note that the first four abilities move forward from the situation toward the goal, while the fifth and the sixth abilities lead the problem solver to work backward from the goal toward the situation. The fourth and fifth abilities (the ability to think of alternative outcomes of a given situation, and the ability to list attributes of the specified goal or desired situation) may be particularly applicable to the study of social problems and might well be emphasized in the development of textual and curricular materials.

Merrifield's findings do confirm the importance of two skill-categories to problem solving ability: the analytic cognition of goals, and the development of adequate search models in processing available data. The practical use of such a piece of knowledge would seem to promise high payoff in the classroom. Unfortunately, such is not the case. The issue of translating this knowledge into classroom practice has not been squarely faced. We are left with a host of unanswered questions: To what extent are these skills presently developed by social studies students? At which stages of intellectual maturation is such skill development most readily accomplished? What learning materials and instructional techniques support the acquisition of these skills?

J. Richard Suchman

Techniques for strengthening inquiry skills in the elementary school were developed in the University of Illinois studies of inquiry training, conducted from 1960 to 1964 by Professor J. Richard Suchman. Suchman defines inquiry as the act of creating individual knowledge by gathering and processing information. This approach shifts the emphasis from the storage of information and conclusions (an emphasis all too characteristic of traditional social studies) to the processing and interpreting of data. The inquiry procedure developed by Suchman centers around a series of discrepant or incongruous events which must be assimilated and explained by the observer. Finding out why an event occurred or why a certain situation exists means, in the inquiry context, altering the conceptual structure in such a way that the learner may fit into it that which he perceives. Suchman used brief films presenting problem episodes which highlight a discrepancy or incongruency and leave the students with the problem of explaining what they saw, by means of asking increasingly precise questions.

Suchman's inquiry procedure includes four types of action: searching, data processing, discovery, and verification. *Searching* includes planning and control of data-intake as contrasted with the frequent passive observation of a learner. Training and practice in the experience of searching should alert the learner to his development of "search sets" or abstract patterns with which he sifts his data and tests them for goodness of fit. The learner also recognizes that the same data may be profitably processed over and over again as long as the search sets are readjusted.

The data processing action of the inquiry procedure aims at continually reducing information to ever simpler and more systematic patterns in order that regularities can be discerned. Suchman's work identifies four types of data processing, which play major roles in the inquiry procedure: (1) analysis, the breaking down of data complexes into component parts; (2) comparison, the bringing together of comparable elements to make similarities and differences more evident; (3) isolation, the selective separation and attention to small groups of variables in order to reduce cognitive strain resulting from excessive diffusion of attention; and (4) repetition, the repeated juxtaposition of data elements to decrease the probability of unrecognized relationships.

Discovery refers to those instances of sudden fit between the data and the explanatory devices of the learner. "Discovery occurs only when a discrepancy between what is perceived and what is known blocks assimilation and then is overcome by some cognitive act." (Suchman, p. 11.) This discovery phase comes about in several ways. It may occur when a percept (an object or event which is perceived) is analyzed into component parts and the unfamiliar aspects translated into more familiar terms. Discovery may come as a result of matching two concepts already learned; or, more importantly, discovery may come as the result of a "conceptual shift." In the latter instance, discovery is blocked, prior to the shift, because the learner's conceptual system is inadequate to permit any explanation of the phenomenon he observes.

Verification, the fourth type of action in inquiry procedure, occurs when the questions are asked: Can the new conceptual system be used to make reliable predictions? Does it explain all relevant cases which may appear in the future? The entire process of inquiry centers around the development of explanatory theories; the verification phase underscores the tentativeness of these theories and requires a continuing check with reality.

The Suchman studies make four claims for training in inquiry: (1) Inquiry training teaches children to gather and organize data. (2) Students learn to isolate variables. (3) Inquiry procedures train students to hypothesize concerning relationships among variables. (4) Students develop the skill of testing hypotheses by means of verbalized experiments.

It is important to note that the inquiry formulation as described above does not include the process of recognizing and identifying a problem; the training approach designed by the Illinois group begins with the response to a previously defined problem. For social studies research to overlook this phase of problem solving procedure would seem a serious omission. It may be that in grappling with social reality and with discrepancy in the social world, the major task of problem solving lies in the definition and identification of the problem itself.

Jerome Bruner

Bruner's work with discovery learning (1964) also places the learner in the role of one who generates his own personal knowledge. Discovery, according to Bruner, is a matter of rearranging evidence in such a way that one is able to go beyond that evidence to additional insights. Bruner places the student in the role of hypothesizer, and emphasizes the development of an "as if" attitude and an awareness of alternatives in any situation. Bruner claims that effectiveness of instruction begins with the exploration of alternatives and the implanting of a predisposition toward this exploration. (NSSE *Yearbook,* p. 308). Benefits of discovery learning are claimed to be an increase in intellectual potency, a shift from extrinsic to intrinsic rewards, learning the heuristics or generalized transferable patterns of discovery, and an aid to memory processing.

R. M. Gagne

The classification of problem solving behavior as a form of learning appears as a theme common to several of these recent approaches. Earlier views dealt with problem solving as a process that followed learning and "did something" with that which was learned. Gagne (1964) rejects the idea that the solving of a problem is an event preceded by learning. It is his thesis that problem solving itself constitutes a form of learning. If problem solving is to occur, he reasons, it must be preceded by several simpler forms of learning. Gagne's taxonomy of learning describes levels of increasing complexity;* each successive learning level requires as its prerequisites all of those types of learning preceding it in the taxonomy.

The most complex type of learning is problem solving. Problem solving is defined as "thinking out" a new principle that combines previously learned principles. The conditions necessary for this act of learning are as follows:

1. The learner must have a goal; he must be able to identify the essential features of a desirable solution before he arrives at the solution.

2. In addition to an awareness of a goal the problem solver must be able to recall relevant principles which he has previously learned.

3. The problem solver must be able to recombine these recalled principles in order that a new principle may emerge.

According to Gagne, learning by means of problem solving leads to new thinking capabilities. These include higher-order principles rearranged and restated, and sets of strategies that determine the direction of thinking.

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* The performance of each level of task complexity requires the mastery of all lower levels. The hierarchy proceeds from bottom to top: (a) response learning, (b) response chaining, (c) establishment of labeling responses, (d) concept learnings, (e) principle learning, and (f) problem solving.

Heuristics

The study of heuristics has received renewed attention as an important adjunct in the theory of problem solving. Newell, Shaw, and Simon, who pioneered the development of computer models of human problem solving behavior, found that the most successful problem solvers displayed common strategies of problem analysis. The educator's interest is piqued, of course, by the question: If there exist such basic strategies, can they be incorporated in the curriculum and learned by the student?

An heuristic is a very general strategy that may help one capitalize on his own knowledge, skill, and experience in thinking up new ideas for problem solutions. (Daniels 1964.) Generally, an heuristic produces a change in the person himself by means of redesigning his conception of the problem situation, learning some new skill, analyzing the components of the desired goal or discovering something unnoticed about the environment. In effect, an heuristic method is a strategy which sharply curtails the search for a solution,* and is deemed helpful as an economy in time and effort. It is obvious that the price of this limited search effort may be the occasional oversight of a "best" solution.

What are some of the examples of heuristic approaches to the solution of a problem?

Most humans use the heuristic of aligning the new problem with a similar problem from one's previous experience and proceeding with attack methods that had proved successful in earlier instances. This heuristic is obviously most useful in a consistent or steady-state environment. Its effectiveness is strictly proportionate to the degree of "match" between the new problem and the old.

Another heuristic employed by most of us at various times is that of "working backward." This begins with careful analysis of the goal aspect of the problem situation, followed by a reverse-tracing of steps which, if followed, might result in this goal situation. Such an approach is not dissimilar from a "means-end analysis"; an initial problem is gradually transformed into a target state, or moved to the goal situation, through step-by-step reduction of the difference between the two states. (The TOTE unit discussed earlier is a variation of this kind of heuristic.)

In addition to our using these heuristic approaches in the solution of personal problems, it can be seen that they may be relevant to the work of most social studies classrooms in aiding the consideration of social problems. For example, a discussion of the problematic facets of present-day defense expenditures may be facilitated by review of somewhat parallel situations in our own history or that of other societies, or some insights, perhaps useful (though potentially misleading), may be gleaned by reducing the problem model to that of a single family's consideration of security means.

The question *"Can heuristic strategies be taught in the classroom?"* remains with us. We know of no research relating this question to the teaching of social studies, but the work of Daniels contributes significantly to general research on the question. On the assumption that thinking of solution-relevant properties in a problem situation will be conducive to the invention of a strategy for arriving at a solution, Daniels attempted to teach his subjects the heuristic of property analysis. The research findings suggest that a subject who analyzes solution-relevant properties will, in fact, be led more quickly to a solution of the problem. Part of Daniels' training procedure called for a practiced scrutiny of the subject's "assuming process," of the unwarranted assumptions usually made while solving problems.

This section has reviewed a sampling of recent developments in problem solving theory and suggested points of relevance of this general theory to the specific interests of social studies. One question seems to press upon us: Are the changes and developments in problem solving theory reflected in social studies instruction? If our specific curriculum area is sensitive to changes in general theory, this sensitivity should appear in the development of new kinds of instructional materials. As one test of this question, the next section will survey some of the trends in the development of social studies materials.

PART III. Review of Trends in the Development of Social Studies Materials

All of the theorizing here is for naught, of course, unless we see some linking of theory and practice. The obvious and necessary question arises: Are new instructional materials making use of advances in theory? A survey of representative materials yields a mixed answer.

There is, certainly, evidence that curriculum designers have paid heed to theory development in some important respects. The great emphasis on inquiry learning relies heavily on the idea that the learner generates his own knowledge and that this process of knowledge-generation occurs as the result of the learner's encounter with a baffling, or unresolved, or problematic question or situation. There is, further, wide use of the idea that a problem situation can be approached more readily by working first with a simplified model of the situation, as in the use of games and simulations.

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* In the same way that certain rules of multiplication and division dictate procedures which drastically reduce the work of testing every possible combination of numbers.

On the other hand, the theory described here contains signposts which have been unnoted and untested by practitioners. Curriculum developers appear to take little cognizance of the stages of intellectual development identified by Piaget. The component skills of problem solving set forth by Merrifield and Guilford are given no explicit treatment. The learner's necessary and growth-producing experience with accommodation and assimilation (Suchman) continues to be unplanned and accidental. Until these signposts and others are given specific attention we remain subject to the charge of allowing a possibly rich capital to lie idle.

The most dramatic changes in materials are probably reflected in the wide use now given to the case study approach and to the active interest in games and simulations. Both developments attempt to provide students with problematic situations which approximate those encountered in real life. Both seem to offer the possibility of increasing the student's involvement and interest. Since the volume of classroom material of this nature is mounting at a rapid pace, any effort to include here an exhaustive review of all available materials would be outdated within a few months and will not be attempted.

Case Studies. The student is presented with a "real world" case or episode which ends in a dilemma situation and leaves him with the necessity to decide which actions might resolve the dilemma. The data presented in the case might conceivably support several alternative decisions. The case is left as open-ended as possible, with judgments and decisions suspended. Generally speaking, the student has the task of identifying the alternatives, considering each in the light of the data, and presenting his decision with its supporting warrants.

A set of ten case studies based on American business enterprise has been developed by Paul Cawein (Gibson, p. 61) for the Newton, Massachusetts schools. The episodes confront students with dilemma situations which require their grappling with fundamental economic problems. The subject-content of the cases stresses business history and basic economic concepts.

A program of case studies on democracy, "Judgment," has been developed by the National Council for the Social Studies under the direction of Merrill Hartshorn. Each case is structured on a significant decision of the United States Supreme Court. The first five of these case studies set forth the decisions of the Court Justices on Bible Reading and Prayer in Public Schools, Congressional Reapportionment, The Right to Legal Counsel, Privilege Against Self-Incrimination, and Security of Citizenship. Each study details the background of the case, describes the specific situation which brought the case before the Supreme Court, reviews the testimony presented to the Court, and summarizes the majority as well as dissenting opinions.

The Harvard Social Studies Project has developed a very usable series of case studies which attempt to train students to analyze public controversy prior to making a decision. (Oliver and Shaver, 1963.) Among the cases dealt with are school desegregation and the power and responsibility of the Labor Movement. The experimental curriculum built around these studies treats specifically three aspects of controversy-analysis: (1) setting factual issues; (2) handling problems of word usage and meaning; and (3) dealing with value conflicts (Shaver). Evaluation of this experimental curriculum indicates that students did develop a complex and effective style of analysis in discussing public issues, and that—when compared with control students—this gain did not come at the cost of gains in traditional social studies knowledge.

Also noteworthy are those studies on civil liberties developed by the Lincoln Filene Center at Tufts University. (Parker, O'Neil, and Econopouly.) The cases deal with five themes: protecting the rights of the accused, equal opportunity under law, property and economic rights, freedom of religion, and the freedoms of speech, press, and assembly. Each case points up a clear inconsistency in political or economic rights, and offers rich material for classroom or small group discussion. The cases are concisely written and are usable at a variety of grade and ability levels. Each set of cases is followed by a section describing the legal and constitutional basis of the civil liberty under consideration.

An inside look at politics at the applied and local level is provided in the series sponsored by the Eagleton Institute of Politics. Titles such as *The Little Rock Recall Election,* and *The Defeat of Home Rule in Salt Lake City* attempt to give the student a realistic understanding of partisan political activity.

The American Foundation for Political Education has used a semi-fictional approach to American politics for the purpose of increasing student interest and motivation. These "case-stories" combine factual case study material with a kind of short story or episode which afford students situational and exemplary material on which to base their reflections. Titles included in the series are: *Desegregation in the Public Schools, Political Patronage, Police Use of Wiretapping, The Decision to Drop the Atomic Bomb.*

The Lincoln Filene Center has used the case study approach in its development of an action course in practical politics. Case material provides familiarity with local political party organization, the precinct system, the political campaign and political clubs. This volume, *Practical Political Action* (Patterson, ed.), is paralled by video-taped dramatizations of political case studies available for classroom use. The series, *Practical Politics* (Gibson, p. 63), directed by Wyman Holmes, includes four twenty-minute programs. Each case presents a political issue but leaves the problem unresolved. Pilot evaluation of the use of these film tapes points to their effectiveness in leading students to make decisions for themselves, as well as helping them develop skill in analyzing and setting forth the rationale supporting the decision.

Gaming and Simulation

The application of these procedures to the social studies classroom is receiving increasing attention. Generally speaking, such an approach rests upon the assignment to individual students or groups of students the role of decision-maker in a situation of potential conflict. Prominent in the early development and testing of classroom simulations was Professor James S. Coleman of Johns Hopkins University.

The Coleman group began its work with the development of three games to be used with adolescents. In the career game the player begins with the hypothetical profile of a boy or girl, age 15, and carries him or her through decisions about courses in school, further education, job choices, marriage and family decisions, up to age forty or fifty. The legislative game, played by six to ten players, assigns each player the role of a legislator whose success is determined by his legislative enactment of his constituents' wishes. The community disaster game assigns to the six to nine players a responsible role in a community hit by disaster.

The games have been tested in a variety of classroom situations representing lower to upper socioeconomic strata, and the lowest and least literate to the gifted ability groups. They have been used in groups numbering as many as 250. (Coleman, *et al.,* 1964.) Among the instructional values claimed for the games, aside from the learning of content specific to each game, are the unusually high degree of motivation and involvement evidenced by student participants. Other benefits are said to include the self-disciplining feature of games (classroom control becomes a function of the rules of the game), and the fact that the games are self-judging—the student's measure of success is the outcome of the game. Two other reported outcomes should be mentioned. Students gain an increase in their estimate of the complexity of future decisions at the same time that they give evidence of an increased confidence and interest in planning for the future.

In addition to games which afford students experience with problems of a personal and community nature, important work has been done in the simulation of international problems. Classroom use of this latter type of game was pioneered by Cherryholmes in the Lawrence, Kansas, high school. Evaluative follow-up of the Lawrence work suggests an increase in students' insight into foreign policy decision making as well as in their appreciation of the complexity of these decisions.

A series of computer-based economics games for elementary school level has been developed, under a grant by the United States Office of Education, in Northern Westchester County, New York (Wing). In addition to testing a gaming situation as an instructional device, the research project includes pioneer efforts to individualize instruction by means of electronic data processing equipment. An IBM 7090 computer is used with IBM 1050 typewriter terminals to allow multiple "individual-teaching" possibilities.

Among the games under development by this project is The Sumerian Game, designed to teach students in the sixth grade basic economic principles in use at the time of the neolithic revolution in Mesopotamia. The student assumes the role of ruler in the city-state of Lagash in the year 3500 B.C. After an initial orientation to the rules of play and to the economic conditions of Lagash before the game begins, the student confronts a series of problematic situations. Each is a variation of the problem: "We have harvested 5,000 bushels of grain to take care of 500 people. How much of this grain shall be set aside for the next season's planting, and how much will be stored in the warehouse? The remainder will be given to the people to eat." Variations and complicating factors include an increasing population, the application of surpluses to craft and trade development, and the ensuing complexities of a changing economy.

Man: A Course of Study. A portion of the elementary social studies curriculum designed by Educational

Development Corporation includes several simulations. Among these is a board game which simulates a variety of hunting situations which the children would face if they were actually hunters whose subsistence depended on their hunting skill. Initially, the children play alone against the board, but soon discover that by combining resources and efforts they can make greater gains. This pressure toward team work, of course, brings to the surface many problems having to do with cooperation, competition, leadership, and group action. For example, the group is confronted with problems arising on a cooperative hunting venture when only one hunter makes a kill. Later, they compare their solutions with those of real hunting societies by watching a film of the Netsilik Eskimos who have developed elaborate sharing rules appropriate when one member of a hunting party catches a seal.

All of this raises several speculations concerning the transfer of learning possibilities students may gain from experience with gaming. The crucial question is: Does simulation experience in decision making give students skills which can be incorporated in their personal decision making?

Decision theorists would class many problem-oriented exercises as static decision tasks (Edwards): that is, the decision-maker designs and executes an action and estimates its payoff, but is never confronted with the necessity of making further decisions based on changes effected by his prior action. Gaming and simulation situations, on the other hand, usually offer the student experience with dynamic decision tasks—the decider executes a sequence of actions, each based on information obtained pursuant to prior decisions. Such a decision-task sequence requires that the decision include a consideration of changes effected in the environment by each prior decision. In this respect, simulation may offer more transferable experience than the more traditional problems approach.

General Comments

The continuing flow of materials employing a problems approach and the literature discussing this approach indicate a possible increment in knowledge *about* the problems approach, or problem-solving, as it applies in the social studies. Some progress has without doubt been made in the imaginativeness and practicality of textual materials now available to the teacher. Obvious advances have appeared, as well, in the number of teachers adopting some type of problems method. It is important to note, however, that there has been minimal development of evaluative devices with which to measure the acquisition of problem solving skills.

Despite the mountain of books and articles extolling, describing and/or prescribing problem solving, there is a painful absence of hard research concerning the effectiveness of the problems approach in the social studies classroom. When compared with the research on problem solving in the general field of cognition and learning theory, the absence of social studies-oriented research is even more pronounced.

Several major questions should have been asked two decades ago and remain to haunt us today: Does a problems approach in social studies produce different learning outcomes? Does it result in styles of adult political and social behavior which are appreciably different from behavior styles of those products of a more traditional classroom? Does experience in a problems-oriented social studies class affect the decision processes of the student in real life? Do all kinds of people profit equally from problem solving approaches? These questions, and a host of others which follow from them, provide us with an inescapable confrontation: We have yet a great deal to learn about problem solving methods in the social studies. The volumes of material about social studies problem solving are, if anything, an inverse index of research-based knowledge about the topic.

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Chapter 6

Teaching Resources for the Problems Approach

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Scholars in professional education and the social science disciplines have shown renewed interest in teaching approaches which involve students actively in identification of issues and problems, inquiry into their nature and origin, and reflective thinking concerning possible solutions. This trend in the social studies field is documented by a recent increase in the number of books, book chapters, journal articles, and doctoral theses concerned with a problems or closely related instructional approach.

Right now the best source for an introduction to what the problems approach is and how it might be put into practice in social studies classrooms would be the preceding chapters of this Bulletin. Not only have the authors defined contemporary meanings and possible applications of the problems approach, they have provided numerous references to background papers and research dealing with the subject.

Some readers, however, will want to undertake a study in greater depth, reading Dewey's seminal *How We Think* and additional, more recent, volumes and articles. Other readers will be anxious to put the ideas of this Bulletin into effect in their own schools and classrooms and will want to know sources of materials designed for use by students.

This final chapter of the revised problems approach Bulletin is planned to meet, partially at least, both of these needs. It contains annotated references to professional materials for the teacher, plus a long listing of publishers and paperbound books for the classroom. Most of these resources and references do not, however, duplicate the extensive bibliography in the last chapter of the previous edition of *The Problems Approach and the Social Studies,* a previous NCSS Bulletin, published in 1960.

References for the Teacher or Administrator

Choosing references for professional colleagues is a particularly difficult task. In this case, the major challenges were in location and examination of as many materials as possible, deciding which references seemed of greatest potential value, and then listing them in a manner which busy people would find to be convenient.

While the final list may seem exhaustive, it should be pointed out there are many additional sources of information on the problems approach. Prominent among them are elementary and secondary school social studies methods textbooks, virtually every one of which has a section on inquiry, problems, or reflective thinking as an instructional approach. Journal articles are another case in point; while more than 50 are listed, there must be another 50 or more that could be useful to the reader of this Bulletin.

The main criteria used in assembling this list were specific focus on the topic, recency (usually 1960 or later copyright), and general availability. An apparent exception to the availability criterion is the inclusion of seven doctoral theses, normally considered to be among the most precious and inaccessible items around the professional realm. This is no longer true. Each of the theses listed in this chapter is available for $5-$7 on microfilm—or may be purchased at a slightly higher cost as a paperbound Xerox "book." It is quite conceivable that valuable doctoral studies will now be available long after other materials have gone out of print.

BOOKS ON INQUIRY, REFLECTIVE THINKING, AND THE PROBLEMS APPROACH

Bauer, Nancy W., Editor. *Revolution and Reaction: The Impact of the New Social Studies.* Bloomfield Hills, Michigan: Cranbrook School, 1966. 135 p. Paper.

While not concerned exclusively with a problems approach, this report of the Cranbrook Curriculum Conference contains a number of provocative statements by Charles R. Keller, Nancy W. Bauer, Evans R. Clinchy, and Fred M. Newmann which bear on content and process in the "new social studies." An excellent bibliography of non-text social studies materials, by Marcia D. Starkey, includes many titles adaptable to the problems approach at the high school level.

Chase, W. Linwood. *A Guide for the Elementary Social Studies Teacher*. Boston: Allyn and Bacon, Inc., 1966. 234 p. Paper.

Although not designed specifically as an inquiry or problems approach textbook, it contains numerous resources to free the teacher and pupil for classroom research work.

Dewey, John. *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. Boston: D. C. Heath and Co., 1933. 301 p. Cloth.

Considered by many to be the classic in the inquiry or problems field; a restatement and expansion of Dewey's 1910, *How We Think*. In the preface to his edition, Dewey wrote: "This book represents the conviction that the needed steadying and centralizing factor [in education] is found in adopting as the end of endeavor that attitude of mind, that habit of thought, which we call scientific. . . . This book also represents the conviction that . . . the naive and unspoiled attitude of childhood, marked by ardent curiosity, fertile imagination, and love of experimental inquiry, is near, very near, to the attitude of the scientific mind."

Dunfee, Maxine and Sagl, Helen. *Social Studies Through Problem Solving: A Challenge to Elementary School Teachers*. New York: Holt, Rinehart and Winston, Inc., 1966. 386 p. Cloth.

Methods book built around the problem solving approach. Oriented particularly toward the needs of inexperienced elementary school teachers and those who may want to try the problems approach instead of a more limited methodology employing fewer instructional resources and less student involvement. The dialogues at the beginning of each chapter seem valuable in illustrating the operational models and frame of reference of the authors.

Fair, Jean and Shaftel, Fannie R., (Editors.) *Effective Thinking in the Social Studies*. Thirty-seventh yearbook of the National Council for the Social Studies. Washington, D.C.: The Council, 1967. 272 p. Paper or Cloth.

Entire volume devoted to inquiry and reflective thinking, with chapters by noted authorities in the process approach to social studies instruction. Includes sections on diagnosis of thinking strategies and provision of feedback to students.

Fenton, Edwin. *Teaching the New Social Studies in Secondary Schools: An Inductive Approach*. New York: Holt, Rinehart and Winston, 1966. 526 p. Cloth.

Takes the position that high school studies teachers need adequate models for development of inductive approaches in their classes. The book includes a number of readings and other materials which illustrate the operation of an inductive approach to social studies teaching, yet avoids giving final answers to the problems and questions raised in the readings.

Fenton, Edwin. *The New Social Studies*. New York: Holt, Rinehart and Winston, Inc., 1967. 144 p. Paper.

Comprehensive yet concise summary of the social studies education trends of the late sixties, with good coverage of the inductive processes which are being developed in many of the programs.

Guetzkow, Harold; Alger, Chadwick F.; Brody, Richard A.; Noel, Robert C.; and Snyder, Richard C. *Simulation in International Relations: Developments for Research and Teaching*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963. 248 p. Cloth.

Although a bit technical for many readers, this research report should prove extremely valuable for those who are interested in simulation as a means of developing problems. Chapters in the book include descriptions, photographs, and other data on the internation simulations conducted by Professor Guetzkow and his colleagues. For simulation on a more simplified level, see the two *Social Education* articles by John Gearon, cited elsewhere in this chapter.

Hullfish, H. Gordon and Smith, Philip G. *Reflective Thinking: The Method of Education*. New York: Dodd, Mead and Co., 1964. 273 p. Cloth.

Provides philosophical background and numerous suggestions for reconstruction of the school program around reflective thinking. The authors take the position, in the tradition of John Dewey and Boyd H. Bode, that a major function of any school is to teach young people to *think*. Major sections of the book include: An Analysis of Thinking, Tools for Thinking and Learning, and Reflective Thinking as Aim and Method.

Hunt, Maurice P. and Metcalf, Lawrence E. *Teaching High School Social Studies: Problems in Reflective Thinking and Social Understanding*. New York: Harper and Row, Second Edition (1968). 463 p. Cloth.

As the full title suggests, a methods book devoted to use of the reflective thinking approach to social studies teaching. Defines the reflective method, discusses selection of content, and explores special problems involved in teaching through use of the reflective method.

Joyce, Bruce R. *Strategies for Elementary Social Science Education.* Chicago: Science Research Associates, Inc., 1965. 302 p. Cloth.

Methods book organized on the assumption that elementary school teachers will involve their pupils in a search for knowledge somewhat parallel to that followed by scholars in the relevant social science disciplines.

Kenworthy, Leonard S. *Background Papers for Social Studies Teachers.* Belmont, California: Wadsworth Publishing Co., Inc., 1966. 248 p. Paper.

Provides teaching ideas, quotations from basic documents, interpretations, resumes, reading lists, and other source material on more than one hundred secondary school social studies topics. Teachers using a problems or inquiry-centered approach can tear out the perforated sections for convenient filing by topics or for use by members of the class.

Kenworthy, Leonard S. *Guide to Social Studies Teaching in Secondary Schools.* Second Edition. Belmont, California: Wadsworth Publishing Co., Inc., 1966. 393 p. Paper.

While not devoted exclusively or even primarily to the problems approach, contains an unusually comprehensive list of teaching materials and suggestions. Includes lists of resources, addresses of publishers, foreign embassies supplying materials to schools, and other basic sources which would be helpful to assembling raw material for class investigation of a current problem.

Massialas, Byron G. and Cox, C. Benjamin. *Inquiry in Social Studies.* New York: McGraw-Hill Book Co., 1966. 353 p. Cloth.

Besides defining and illustrating the use of inquiry as a vehicle for development of important social understandings, contains excellent summaries of existing research on inquiry and reflective thinking. Contains summaries of the new movement in each of the social science fields, a background reading list for educators who wish to gain a better interdisciplinary perspective in the social sciences, and numerous suggestions for the experienced and beginning teacher.

Massialas, Byron G. and Zevin, Jack. *Creative Encounters in the Classroom: Teaching and Learning Through Discovery.* New York: John Wiley and Sons, Inc., 1967. 274 p. Cloth.

Report of exploratory studies in two high schools. Provides descriptions of instructional procedures and student activities as well as the rationale and basic approach used in an inquiry or discovery approach. The volume can be very useful as a partial model for those who wish to shift their social studies teaching toward an inductive pattern based on structure and process in social science disciplines.

McPhie, Walter E., Compiler. *Dissertations in Social Studies Education: A Comprehensive Guide.* Washington, D.C.: The National Council for the Social Studies, 1964. 99 p. Paper.

Lists 566 doctoral dissertations for the years 1934-1962, inclusive. While the listing covers all phases of social studies education, there are a dozen or more studies cited and annotated in problem solving, critical thinking, decision making, and reflective thinking. The basic listing is grouped under topics; however, subject and author indexes are provided for ease of locating a particular study.

Muessig, Raymond H. and Rogers, Vincent R., Editors. *Social Science Seminar Series.* Columbus, Ohio: Charles E. Merrill Books, Inc., 1965.

Series of six paperback books, one for each social science usually included in the social studies curriculum. Aside from identification of the essential structure and certain new trends in each field, something that has been done in several other reports, the series is unique in that Muessig and Rogers (social studies specialists) contributed a teaching methods section for each volume. Many of the suggestions follow an inquiry or problem-solving approach and, therefore, constitute a valuable resource for the classroom teacher. Titles in the series include:

Anthropology, by Pertti J. Pelto. 118 p.
Economics, by Richard S. Martin and Reuben G. Miller. 165 p.
Geography, by Jan O. M. Broek. 116 p.
History, by Henry Steele Commager. 160 p.
Political Science, by Francis J. Sorauf. 115 p.
Sociology, by Caroline B. Rose. 117 p.

Oliver, Donald W. and Shaver, James P. *Teaching Public Issues in the High School.* Boston: Houghton Mifflin Company, 1966. 330 p. Cloth.

Based in part on work of the Harvard University Social Studies Project. The authors advocate and describe a jurisprudential approach for students in junior and senior high school social studies classes. Includes sections on choosing content, concepts to be used in framing and analyzing political controversy, means of carrying through the jurisprudential approach, and details of research conducted thus far.

Selakovich, Daniel. *Problems in Secondary Social Studies*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965. 292 p. Paper.

Attempt to bring together teaching methodology, psychology of learning, and social science content in a problems approach for high school classes. Chapter One provides an historical setting for development of a problems approach in the social studies, description of some current projects in the field, definitions of elements of the problems approach, and an introduction to the series of problems which follow. Chapters Two through Nine present a series of problems important to American society and broken down into elements which can be utilized in the classroom. The problems presented have been tried out with high school and college methods classes under the author's supervision.

Shaftel, Fannie R. and Shaftel, George. *Role-Playing for Social Values: Decision-Making in the Social Studies*. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967. 431 p. Cloth.

Contains a rationale for role-playing as a means to enable children to think reflectively about ethical matters, followed by a series of case stories designed to set the stage for consideration and role-playing of situations involving honesty, responsibility for others, self-acceptance, and the like.

Smith, Herbert F. A. *Secondary School Teaching: Modes for Reflective Thinking*. Dubuque, Iowa: William C. Brown Co., 1964. 285 p. Cloth.

Junior and senior high school general methods book built around reflective thinking as a goal of instruction. Discussions of foundations of secondary school teaching, behavior characteristics of adolescents, and ways to base units of study on reflective thinking. While the book is aimed at teachers in all fields, one section is focused specifically on the social studies.

Smith, James A. *Creative Teaching of the Social Studies in the Elementary School*. Boston: Allyn and Bacon, Inc., 1967. 281 p. Paper.

Excellent volume combining some of the recent findings on creativity in children with specific suggestions on how to actively involve children in a search for knowledge in the social studies. Companion volumes are available in other curricular areas, as well as the overview work, *Setting Conditions for Creative Teaching in the Elementary School*. Allyn and Bacon, 1966. 207 p. Cloth.

DOCTORAL THESES

Baker, Eugene H. "A Comparative Study of Textbook and Simulation Approaches in Teaching Junior High School American History." (Northwestern University) Dissertation Abstracts, 27:3353A-3354A; April, 1967.

Two classes taught with a simulation approach made greater gains in factual knowledge of the Civil War than did two groups taught by reading and discussing textbook assignments. The superiority of the simulation group persisted on a follow-up test given six weeks later, although the differences were not so great.

Cox, C. Benjamin. "A Description and Appraisal of a Reflective Method of Teaching United States History." (Indiana University) *Dissertation Abstracts*, 22:814; September, 1961.

Compared group taught with a reflective thinking approach to one taught in a more traditional manner (high school course in American history). Standardized tests failed to show significant differences between the two matched groups, but some other measures seemed to indicate superiority for the reflective thinking class.

Grandstaff, Marvin E. "Logical Aspects of Critical Mindedness: An Investigation of Criteria Central to the Attainment of Critical Thinking." (Indiana University) *Dissertation Abstracts* 25:4574-4575; February, 1965.

Suggests that mastery of the skills of inquiry might better be designated as critical mindedness. Then attempts to synthesize from literature of logical thinking a set of criteria for the teaching of critical mindedness. Contains a number of provocative ideas on how this might be accomplished.

McGarry, Eugene L. "An Experiment in the Teaching of Reflective Thinking in the Social Studies." (State University of Iowa) *Dissertation Abstracts*, 22:2721; February, 1962.

Author states that most previous experiments with children had assumed that reflective thought improved most dramatically through use of a problem-solving approach. In this study, both groups used the problem method, but one sought mainly conclusions based on facts while the other sought basic understandings. Both groups showed significant gains in ability to think critically, but the second group (the one seeking understandings) made the greater gains.

Peake, Ronald E. "An Examination of the Differences in Problem-Solving Processes of Successful and Non-Successful Students Taking Ninth Grade Social Studies." (University of Alabama) *Dissertation Abstracts*, 25:7111-7112; June, 1965.

Interviewed top one-third and bottom one-third of students who had taken a standardized social studies test. Asked each student to "think aloud" solutions to

ten of the test problems. Found that a checklist representing components of adequate problem-solving behavior discriminated between successful and nonsuccessful students and that results of the checklist study agreed with a judge's estimate of problem-solving ability. Study also lists characteristics of each group in their approach to problem-solving.

Possien, Wilma M. "A Comparison of the Effects of Three Teaching Methodologies on the Development of the Problem-Solving Skills of Sixth Grade Children." (University of Alabama) *Dissertation Abstracts*, 25:4003; January, 1965.

Compared three methods of instruction: (1) inductive, (2) deductive with simple telling and rote learning of facts, and (3) deductive with detailed explanation of underlying causal relationships. Concluded that students exposed to inductive procedures exhibited characteristics of effective problem-solving behaviour more frequently than did students taught by the deductive methods.

Rothstein, Arnold. "An Experiment in Developing Critical Thinking Through the Teaching of American History." (New York University) *Dissertation Abstracts*, 21:1141; November, 1960.

Purpose was to see if, with a concentrated emphasis on the goal of thinking, there would be no loss in the acquisition of subject-matter. Found that students reflected increased ability to apply techniques of critical thinking. Author suggests that new methods and materials need to be employed and that they are best developed by the individual classroom teacher. Also suggests that teacher training institutions should include an emphasis on critical thinking in social studies methods classes.

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Black, Millard H.; Christenson, Bernice M.; Robinson, Richard J.; and Whitehouse, LaVon H. "Critical Thinking and Problem Solving," Section 2, Chapter 6, *Social Studies in Elementary Schools*, Thirty-Second Yearbook of the National Council for the Social Studies, John U. Michaelis, Editor. Washington, D.C.: The Council, 1962. Pp. 150–175.

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Materials for Student Use

At first glance, the problems approach may seem so new and different that teachers and administrators are tempted to automatically raise the cry of "Great idea, but when will the publishers give us the materials to put it into operation?". Closer investigation reveals, however, that a surprising amount of inexpensive but very fine source material now exists, with more on the way.

The list which follows includes hints at major sources such as national curriculum projects which are underway, booklet series designed specifically for the problems or inquiry approach, and about 175 sample titles from the many source books available from paperback publishers.

In the latter case, because of the thousands of titles in print and the rapidity with which new titles appear, a sample of only 3-5 books is given for each series. In some instances, these 3-5 volumes represent a list of 50-75 books currently in print. The best solution to obtaining a complete and up-to-date listing is to request a catalog from the publisher or to use standard library references such as *The Publishers' Trade List Annual,* compiled by Muriel Pollock (R. R. Bowker Co., New York, 1180 Avenue of the Americas) or *Books In Print, U.S.A.*, edited by Sarah L. Prakken and also published by the R. R. Bowker Company.

NATIONAL PROJECT MATERIALS

Anthropology Curriculum Study Project Materials. Chicago: 5632 Kimbark Avenue, 60637.

The project has produced a number of background materials, kits, reproductions of artifacts, maps, and other materials to both present anthropological material at the high school level and to teach the means by which anthropological inferences are developed. Much of the material utilizes an inquiry or problem-solving approach.

Educational Development Center, formerly *Educational Services Incorporated*. Cambridge, Massachusetts: 15 Mifflin Place.

Among the many projects of EDC are several in elementary, junior high, and senior high school level. As they become generally available, some of the films, simulated situations, and games produced in the curriculum series, particularly the Jerome Bruner inspired *Man: A Course of Study* (MACOS) materials, should provide excellent resources for inquiry and problems approaches.

Fund for Education Concerning World Peace Through World Law Materials. New York: 11 West 42nd Street.

Materials on possibilities and issues in world law, intended for high school social studies classes, as well as college and adult seminars. Titles include *World Peace Through World Law,* by Grenville Clark and Louis B. Sohn; *Readings and a Discussion Guide for a Seminar on Legal and Political Problems of World Order,* edited by Saul H. Mendlovitz; and *Peace: The Control of National Power,* by Philip Van Slyck.

High School Geography Project Materials. Boulder, Colorado: High School Geography Project, P. O. Box 1095.

Materials being developed include some, such as the *Portsville Map Model Kit,* which present possibilities for an inquiry or problems approach to human settlement and establishment of urban centers in the world.

Lincoln Filene Center for Citizenship and Public Affairs-Publications. Boston: Houghton Mifflin Co.

Publications of the center, distributed by Houghton Mifflin, include *Civil Liberties: Case Studies and the Law* and *Practical Political Action: A Guide for Young Citizens.* Suitable for use in grades nine through twelve.

PAPERBACK BOOK SERIES

ABC American History Materials. New York: American Book Co., 55 Fifth Avenue, 10003.

Application of the systems approach to secondary school American history courses. Instructional aids range from a good modern textbook and teacher's guide to a collection of basic documents in lab kit form, to a book of problems for class discussion, to a series of overhead projector transparencies. The four major components of the system now are:

> *History: USA,* by Jack Allen and John Betts. 1967. 758 p. Also, *Teacher's Annotated Edition* (Teacher's guide section by John Betts). 1967. 920 p.
>
> Although it might be used as a basic textbook in the traditional sense, volume contains more than the usual number of contemporary color photographs and sketches from each period, a large number of quotations from original documents, and end-of-chapter study aids well suited to a problems or inquiry approach in teaching.
>
> *Viewpoints: USA,* by Bernard Feder. 1967. 393 p. Also: *Teacher's Edition.* 1967. 390 p.
>
> Volume organized around 18 major topics in American History, each of which evoked—or still evoke—strong opinion and continuing debate. No attempt is made to present correct or preferred answers. Instead, conflicting viewpoints are presented on each issue, along with questions to stimulate deeper thought and discussion on the part of the student. Among the 18 topics are: How democratic was Jacksonian democracy? The U.S. commitment to a free world; how far should we go? What direction for the Negro in America? Also available as 16 paperbound booklets.
>
> *Documents: USA,* by Jack Allen. 1967. 35 sections, each with 2-7 booklets.
>
> A lab or kit of primary sources dealing with basic issues in American history. Since the documents are boxed in a convenient file system, several students may use them at the same time. An introduction is provided for each set of documents, along with study questions and a "History Lab" with suggestions for depth research and leads to other sources of information on the issue.
>
> *History in Motion: USA,* by George McMeen. 1967.
>
> Series of overhead projector transparencies, polarized to give simulated motion to trends, battle lines, etc. May be used in conjunction with other elements of the ABC system or with other text and source material.

America in Crisis Series. New York: John Wiley and Sons, Inc., 605 Third Avenue, 10016.

Series which examines critical periods in the nation's history. Each volume deals with a time when the United States was in conflict with a foreign power. Titles include:

> *A Nation on Trial: America and the War of 1812,* by Patrick White. 1965. 177 p.
>
> *America's Road to Empire: The War With Spain and Overseas Expansion,* by H. Wayne Morgan. 1965. 124 p.
>
> *The Great Departure: The United States and World War I,* by Daniel Smith. 1965. 221 p.
>
> *The Reluctant Belligerent: American Entry Into World War II,* by Robert Divine. 1965. 172 p.

Bantam Extra, Matrix, and Pathfinder Editions. New York: Bantam Books, Inc., 271 Madison Avenue, 10016.

New titles appear regularly. Those now in print include:

> *Essential Works of the Founding Fathers,* edited by Leonard Kriegel. 1964. 469 p.

The Great Dissenters, by Fred Reinfeld. 1964. 172 p.

When the Cheering Stopped, by Gene Smith. 1964. 257 p.

Banners at Shenandoah, by Bruce Catton. 1965.

CASE Economic Literacy Series. Washington, D.C.: The Council for Advancement of Secondary Education, 1201 Sixteenth Street, N. W.

Materials which might be adapted to a problems unit of study include *Capitalism and Other Economic Systems,* by Baldwin Lee; *Money and Banking in the American Economy,* by Weldon Welfling; and *Business Enterprise in the American Economy,* by Laurence de Rycke and Alvin H. Thompson. Teacher's guides, not necessarily oriented to a problems approach, are also available for some titles in the series.

Case Studies in American History. Educations Publishing Service, Cambridge, Mass.

An 86-page book developed by E. A. Eames and Nancy Martin. Contains 14 case studies drawn on source materials and including topics from *Roger Williams* and *Mr. Madison's War* to the *New Deal* and *N.A.T.O.* Each case is open-ended and is introduced by the authors.

Columbia University Paperbacks. New York: 2960 Broadway, 10027.

Not technically a series, but publications include a number of useful titles such as:

The Rise and Fall of Civilization, by Shepard Clough. 1961. 291 p.

Primitive Views of the World, edited by Stanley Diamond. 1964. 210 p.

The Economic Interpretation of History, by Edwin Seligman. 1961. 166 p.

Decision-Making in the White House, by T. C. Sorensen. 1963. 94 p.

Man, the State and War, by Kenneth Waltz. 1959. 263 p.

Curriculum-Resources, Inc. Materials. Chicago: Published in cooperation with Scott, Foresman and Co., 433 East Erie Street, 60611.

American Government Series: Titles now in print include (others are in preparation):

Unofficial Makers of Public Policy: People and Parties in Politics, by J. H. Fenton. 1965.

Securing the Blessings of Liberty: The Constitutional System, by A. N. Holcombe. 1964.

Official Makers of Public Policy: Congress and the President, by L. W. Koenig. 1965.

Promoting the General Welfare: Government and the Economy, by L. D. Musolf. 1965.

The Political Role of the Courts: Judicial Policy Making, by Glendon Schubert. 1965.

Secondary School Economics Materials. Extensive series on economic history and possibilities in the United States and other areas of the world. Teacher's guide available. Titles include:

China, Development by Force, by Perry Chang. 1964. 80 p.

The Growth of Industrial Enterprise 1860–1914, by Lance Davis. 1964. 72 p.

Latin America: Reform or Revolution?, by Carl Madden. 1963. 72 p.

Decisions That Faced the New Nation, 1783–1820, by Douglass North. 1964. 72 p.

Sub-Saharan Africa: Struggle Against the Past, by Salkever and Flynn. 1963. 72 p.

Elementary School Economics Books. Among the few economics materials suitable for elementary schools. Titles are:

Man and Machines Work Together (Grades 3–4), by Mildred Borton. 1961.

Transportation: Lifeline to America (Grades 5–6), by Harold J. Bienuenu. 1961.

The 8mm. Documents Project. Boulder, Colorado: Thorne Films, Inc., 1229 University Ave.

Series of 8mm film loops of historic events. The list of over 50 titles includes footage from the Spanish-American War, the dust bowl of the 1930's, the attack on Pearl Harbor, significant speeches, and the like. Loops are relatively inexpensive, about five minutes in length, and silent. Used as stimulus material, they have potential for opening problem areas for consideration by social studies classes.

Ginn Studies in Depth. Boston: Ginn and Co. Back Bay P. O. Box 191, 02117.

Includes 12 volumes in the "Today's World in Focus" series. Each deals with an emerging nation or an important area, such as the Middle East or Africa. Suitable for upper elementary through high school levels. Other Ginn paperback materials include:

The Human Side of American History, edited by Richard Brown. 1962. 305 p.

Atlas of American History, by Donald Cole. 1963. 142 p.

The Human Side of World History, edited by Ralph West. 1963. 180 p.

Harper and Row Paperbacks. New York: Harper and Row, Publishers. 49 East 33rd Street, 10016.

Publications include a number of classic volumes useful for senior high school history classes. Among those in print are:

Notes on the State of Virginia, by Thomas Jefferson. 1964. 228 p.

The Russian Revolution (2 volumes), by N. N. Sukhanov. 1917. 668 p.

American Heritage Junior Library. A dozen or more volumes suitable for upper elementary or junior high school levels. Titles include:

The French and Indian Wars, by Russell and Gipson. 1962.

Indians of the Plains, by Rachlis and Ewers. 1960.

The Pilgrims and Plymouth Colony, By Ziner and Willison. 1961.

Heath Publications. Boston: D. C. Heath and Co., 285 Columbus Avenue 02116

Heath Basic Concepts Series. Suitable for senior high school. Basic concepts from history and the social sciences, with guide questions and bibliography for further reading. Titles in print now include:

Liberty and Power in the Making of the Constitution, by Frederick Bauer. 1963. 76 p.

Slavery and the Breakdown of the American Consensus, by Wayne Frederick. 1964. 79 p.

Realism and Idealism in Wilson's Peace Program, by Thomas Lyons. 1965. 104 p.

The Status Revolution and the Progressive Movement, by Wesley Roehm. 1963. 66 p.

Conflict and Consensus in the American Revolution, by Donald Schultz. 1964. 65 p.

Amherst Problems in American Civilization Series. Well-known collections of source materials on American history, best suited to senior high school level. More than 40 titles now are available. Among them are:

Intervention, 1917: Why America Fought, edited by Warren Cohen. 1966. 118 p.

American Neutrality and the Spanish Civil War, by Allen Guttmann. 1963. 115 p.

The Meaning of McCarthyism, edited by Earl Latham. 1965. 115 p.

The Meaning of Jacksonian Democracy, by Edwin Rozwenc. 1963. 124 p.

The Debate Over Thermonuclear Strategy, edited by Arthur Waskow. 1965. 114 p.

New Dimensions in American History Series. Intended for senior high school level. Among titles in print are:

The Missouri Compromise: Political Statesmanship or Unwise Evasion?, by Richard Brown. 1964. 85 p.

Responses to Economic Collapse: The Great Depression of the 1930's, by Edward Merrill. 1964. 151 p.

Immigration: A Study in American Values, by Edmund Traverso. 1964. 145 p.

Problems in European Civilization Series. Volumes similar to those in the Problems in American Civilization materials. Written for high school social studies classes. Recent additions to the more than 40 titles in print include:

The "Scramble" for Africa: Causes and Dimensions of Empire, edited by Raymond Betts. 1966. 88 p.

The Holy Roman Empire in the Middle Ages, edited by Robert Herzstein. 1965. 78 p.

The Expansion of Europe, edited by De Lamar Jensen. 1967. 123 p.

The Thirty Years' War: Problems of Motive, Extent and Effect, by Theodore Rabb. 1964. 74 p.

Enlightened Despotism: Reform or Reaction? Edited by Roger Wines. 1966. 81 p.

Problems in Asian Civilizations Series. Columbia University series suitable for senior high school students. Titles in print include:

The Kuomintang Debacle of 1949: Conquest or Collapse? Edited by Pichon Loh. 1965. 114 p.

Gandhi: Maker of Modern India? Edited by M. D. Lewis. 1965. 128 p.

The Pattern of Chinese History: Cycles, Development, or Stagnation? Edited by J. Meskill. 1965. 108 p.

Democracy in Pre-War Japan: Groundwork or Facade? Edited by G. O. Totten. 1965. 128 p.

The Partition of India: Causes and Responsibilities, edited by T. Walter Wallbank. 1966. 103 p.

Selected Resource Materials for College Research Papers. Although labeled for college use, suitable for many senior high school students. About 15-20 titles usually available, many of them originally compiled in the 1950's. Among the more recent volumes are:

Liberty and Terror in England: Reaction to the French Revolution, by Roland Bartel. 1965. 118 p.

The Death Penalty: A Literary and Historical Approach, edited by McGehee and Hildebrand. 1964. 160 p.

Images of the Negro in America, edited by Turner and Bright. 1965. 113 p.

Holt, Rinehart and Winston Publications. New York: 383 Madison Avenue, 10017.

Paperback primary and secondary source material designed for high school use. Depending on number of pages, costs range from one to two dollars per volume. Recently, some of the materials were gathered together and are offered as study shelves for social studies classes. (Other series published by Holt, Rinehart and Winston, Inc. for college classes also may be adaptable for senior high school.) Publications available include the following series.

American Problems Series. More than 20 current titles. Among them are:

Taxation, Spending and the National Debt, by Juanita Kreps. 1964. 64 p.

Civil Rights and Liberties, by Chase Mooney. 1965. 79 p.

Foreign Affairs, by Saul Padover. 1964. 79 p.

Personal Health, by Neil Rosser. 1965.

Political Parties and Democracy, by E. S. Schattschneider. 1964. 64 p.

American Problems Studies. Each volume somewhat larger than those in the preceding series. More than 15 titles now in print, with others planned. Titles include:

The American Revolution: How Revolutionary Was It? By George Billias. 1965. 122 p.

The Frontier Thesis—Valid Interpretation of American History? By R. A. Billington. 1966.

Puritanism in Seventeenth-Century New England, by D. D. Hall. 1966.

The Robber Barons, by P. d'A. Jones. 1966.

Woodrow Wilson and the League of Nations, by R. Stone. 1966.

Berkshire Studies in European History. Most are revisions or new printings of classic studies. Among the 10 or more titles in print are:

The Age of Metternich, 1814-1848, by Arthur May. 1963. 152 p.

The Crusades, by Richard Newhall. 1964. 136 p.

The Origins of World War I, by J. Remak. 1966.

Source Problems in World Civilization. Designed to give students an introduction to the historian's task of selection. Most material is primary source material. Titles in the series include:

The Spanish Conquistadores: Men or Devils? By John Bannon. 1960. 43 p.

Feudal Institutions: Cause or Consequence of Decentralization? By Robert Hoyt. 1961. 35 p.

The Tenth Century: How Dark the Dark Ages? By Robert Lopez. 1959. 58 p.

Houghton Mifflin Research Series. Boston: Riverside Press, 1960.

Selected source readings prepared for college students, but can be used with bright secondary school pupils. Containing about 150 pages each of annotated sources, the series includes titles such as: *The Age of Elizabeth, The Monkey Trail, Richmond in Time of War.*

NCA Foreign Relations Series. River Forest, Illinois: Laidlaw Brothers.

Materials produced by the Foreign Relations Project of the North Central Association of Colleges and Secondary Schools. Consists of a number of booklets (priced under $1.00 each) on nations, international organizations, and other foreign relations issues frequently in the news. Among titles currently available are:

Chinese Dilemma, by John Armstrong. 1965. 60 p.

The New Europe, The Common Market, and The United States, by Harold Deutsch. 1964. 67 p.

America's Role in the Middle East, by S. Shepard Jones, 1965. 60 p.

The United States and World Affairs, by E. Raymond Platig. 1965. 84 p.

Japan—Ally in the Far East, by Robert Scalapino. 1964. 67 p.

New American Library Editions. New York: New American Library of World Literature, Inc., 501 Madison Avenue, 10022.

Reprints of classics or collections of significant documents, with commentary. Among currently available titles are:

Letters from an American Farmer and Sketches of 18th Century America, by J. de Crevecoeur. 1963. 477 p.

A Documentary History of the United States, compiled by Richard Heffner. 1965. 334 p.

The Living United States Constitution, by Saul Padover. 1963. 176 p.

Prentice-Hall Materials. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 07632.

Several series in history, economics, and interdisciplinary studies. Volumes in each of the series priced at around two dollars and designed for senior high school or college use. Some might be adapted for gifted elementary or high ability junior high school classes. Series now in print include the following.

Classics in History Series. Reprints of ten or more classic but sometimes unavailable works. Sample titles are:

History of the United States During the Administration of Jefferson (Volume 1) *and Madison* (Volume 2), by Henry Adams.

The New Nationalism, by Theodore Roosevelt.

The New Freedom, by Woodrow Wilson.

Eyewitness Accounts of American History. Dozen or more titles, mainly collected essays and other accounts from various periods of American history. Those now in print include:

Reconstruction, 1865-1877, edited by Richard Current. 1965. 183 p.

The Progressive Movement, 1900-1915, edited by Richard Hofstadter. 1963. 185 p.

Slavery Defended: The Views of the Old South, edited by Eric McKitrick. 1963. 177 p.

The Twenties: Fords, Flappers and Fanatics, edited by George Mowry. 1963. 186 p.

The Causes of the Civil War, edited by Kenneth Stampp. 1965. 186 p.

Global History Series. Number of volumes written from a global perspective. Some are organized around history, others are interdisciplinary in approach to world events and problems. Titles currently available include:

The Political Awakening of Africa, edited by Emerson and Kilson. 1965. 175 p.

Asia on the Eve of Europe's Expansion, edited by Lach and Flaumenhaft. 1965. 213 p.

Russia's Eastward Expansion, edited by George Lensen. 1964. 184 p.

Africa in the Days of Exploration, edited by Oliver and Oliver. 1965. 152 p.

Modern Nations in Historical Perspective. More than 20 volumes, including:

France, by John Cairns. 1965. 180 p.

Russia, by Robert Daniels. 1964. 152 p.

Cuba, Haiti, and the Dominican Republic, by John Fagg. 1965. 181 p.

Poland and Czechoslovakia, by Frederick Heymann. 1966. 181 p.

Central America, by Mario Rodríguez. 1965. 178 p.

Asian Civilization Series. Interdisciplinary readings, most of them paired for each nation or area—one dealing with ancient or traditional periods and the other with modern trends. Titles include:

Modern China, edited by Albert Feuerwerker. 1964.

Traditional India, edited by Oscar Chavorria-Aquilar. 1964.

Modern Economic Issues. A half-dozen or more volumes on public economic issues of the present time. Titles include:

Defense and Disarmament: The Economics of Transition, edited by Roger Bolton. 1966. 180 p.

City and Suburb: The Economics of Metropolitan Growth, edited by Benjamin Chintz. 1964. 176 p.

Economic Growth: An American Problem, edited by Peter Gutmann. 1964. 178 p.

Men Without Work: The Economics of Unemployment, edited by Stanley Lebergott. 1964. 181 p.

The Economics of Poverty: An American Paradox, edited by Burton Weisbrod. 1966. 180 p.

Problems in American History Series. Chicago: Scott, Foresman and Co., 433 East Erie Street, 60611.

Series edited by Fenton and Fowler of Carnegie Institute of Technology. Among the ten or more titles now available are:

The Negro in America, by Larry Cuban. 1964. 176 p.

Labor in American Society, by R. S. Iman and T. W. Koch. 1965. 176 p.

American Foreign Policy, by Leonard F. James. 1966.

Great Depressions: 1837-1844, 1893-1898, 1929-1933, by John Sperling. 1966. 158 p.

Political Leadership in America, by Emmett Wright, Jr. 1966. 160 p.

Public Issues Series. Middletown, Conn.: American Education Press, 1967.

Sixty page source-unit booklets drawn on the Harvard Social Studies Project by Donald W. Oliver and Associates. Focus on problems of interest to junior and senior high U.S. history and civics pupils. Among the available titles, price 25¢ per book, are: *Religious Freedom, Rise of Organized Labor, Negro Views of America, Municipal Politics.*

Rand McNally Materials. Skokie, Illinois: Rand McNally and Co., 8255 Central Park Avenue, 60076.

Materials designed for senior high school or advanced placement and college levels. Some titles, however, contain data not readily found which may be adapted for use by regular junior and senior high school students. Three series now in print are:

Berkeley Series in American History. More than 20 volumes, containing annotated primary sources, bibliography, questions for the reader. Titles include:

The Issue of Federal Regulation in the Progressive Era, by Richard Abraams. 1963. 56 p.

Rebel vs. Tory: The Crises of the Revolution, 1773-1776, by Jackson Main. 1963. 72 p.

The War With Mexico: Why Did It Happen? by Armin Rappaport. 1964. 60 p.

Andrew Jackson, Nullification and the State-Rights Tradition, by Charles Sellers. 1963. 60 p.

The Debate Over the Constitution, by Alfred Young. 1963.

Public Affairs Conference Reports. Series of seminar reports (University of Chicago) edited by Robert Goldwin. Current titles include:

America Armed: Essays on U.S. Military Policy. 1963. 140 p.

Why Foreign Aid? 1963. 140 p.

Political Parties, U.S.A. 1964. 158 p.

Policy Background Series. Background information and possible solutions for policy questions which face the American government. Titles include:

Land For Americans, by Marion Clawson. 1963. 141 p.

Land and Water for Recreation: Opportunities, Problems, and Policies, by Marion Clawson. 1963. 144 p.

Political Participation: How and Why Do People Get Involved in Politics? By Lester Milbrath. 1965.

Scholastic Great Issue Series. Edited by Robert Madgic and Dwight Allen.

An expanding series of 96-page booklets with open-ended use of selected sources for use in high school social studies. Among the titles: *Rebels vs Royalists, Youth and Parents, Napoleon, McArthur vs Truman, Woodrow Wilson and the League.*

Service Center for Teachers of History Pamphlets. Washington, D.C.: American Historical Association, 400 A Street, S.E.

Although not designed primarily for a problems approach, the pamphlets in the series could make a significant contribution to inquiry into issues related to a single historical topic. Among the 40-50 titles available are: *Great Britain in the Twentieth Century,* by Henry R. Winkler; *Japanese History: New Dimensions of Approach and Understanding,* by John Whitney Hall; *African History,* by Philip D. Curtin; and *Five Images of Germany: Half a Century of American Views on German History,* by Henry Cord Meyer.

Social Education Judgment Series. New York: Scholastic Book Service.

Reprints from the series that appeared four times yearly in *Social Education.* Each *Judgment* summarizes an important Constitutional case tried before the U.S. Supreme Court. The facts of the case are outlined, legal issues are described, and majority and minority positions of the court given. The *Teacher's Guide* for each *Judgment* provides a digest of related cases, plus suggestions for use of materials in social studies classes.

Social Studies Paperback Program. Columbus, Ohio: American Education Publications, Inc.

Offers selected paperback books for junior and senior high school social studies classes. Although the program does not require a problems approach, the selection of titles and content of the teacher's guides should make it relatively easy to follow such a procedure rather than an assign-study-recite pattern.

Van Nostrand Materials. Princeton, New Jersey: D. Van Nostrand Co., Inc., 120 Alexander Street, 08540.

More than 100 volumes in two series; the *Anvil Series* under the general editorship of Louis Synder and the *Searchlight Series* under the editorship of George Hoffman and G. E. Pearcy.

Anvil Series. More than 90 volumes in print, each with 150-200 pages of text by a noted scholar and a selection of annotated documents. Designed for use in a variety of ways, with senior high school students. Among the more recent titles are:

The Third French Republic: 1870 to 1940, by Leslie Derfler. 1966. 192 p.

Immigration, The American Mosaic: From Pilgrims to Modern Refugees, by Michael Kraus. 1966. 192 p.

The Weimar Republic: A History of Germany From Ebert to Hitler, by Louis Snyder. 1966. 241 p.

Feudalism, by Joseph Strayer. 1965. 192 p.

The Medieval Universities: Masters, Students, Learning, by Helene Wieruszowski. 1966. 207 p.

Searchlight Series. Extensive list of titles on nations or regions of current interest. Suitable for senior high school social studies classes. Among those available are:

The Balkans in Transition, by George Hoffman. 1963. 124 p.

Argentina: The Divided Land, by Thomas McGann. 1966. 127 p.

India: The Search for Utility, Democracy, and Progress, by Walter Neale. 1965. 128 p.

Military Geography, by Peltier and Pearcy. 1966. 176 p.

Dilemmas Down Under, by James Rose. 1966. 112 p.

Vintage Books. New York: Random House, Inc., 457 Madison Avenue, 10022.

Series of basic and sometimes classic volumes, suited for use by senior high school students. Titles now in print include:

The Crucial Decade—and After: America, 1945-1960, by Eric Goldman. 1960. 349 p.

Anti-Intellectualism in American Life, by Richard Hofstader. 1963.

Prelude to Independence, by Arthur M. Schlesinger. 1958.

Voices From America's Past Series. St. Louis: Webster Division of McGraw-Hill Book Co., 1154 Reco Avenue, 63126.

Series of booklets suitable for upper elementary or secondary school students. All titles in the series edited by Morris and Woodress. Topics include the following, arranged chronologically:

The Beginnings of America, 1607-1763. 1961. 58 p.

The Times That Tried Men's Souls, 1770-1783. 1961. 58 p.

The Age of Washington, 1783-1801. 1961. 58 p.

The Shaping of Modern America, 1865-1914. 1962. 58 p.

Global Conflict: The United States in World War II, 1937-1946. 1962. 58 p.

Washington Square Press Materials. New York: Washington Square Press, Inc., 630 Fifth Avenue, 10020.

Paperbacks suitable for senior high school social studies, some collections or translations of original materials—plus the *Great American Thinkers Series.* Sample titles include:

Living Documents in American History, edited by John Scott. 1962. 658 p.

The Way Our People Lived: An Intimate American History, by William Woodward. 1965.

Great American Thinkers Series. Ten or more volumes, series edited by Thomas Knight and Arthur Brown. Included are:

John C. Calhoun, by Richard Current. 1963.

Benjamin Franklin, by Ralph Ketcham. 1966. 226 p.

World Affairs Multi-Texts. Englewood Cliffs, New Jersey: Scholastic Book Services. 904 Sylvan Avenue, 07632.

Series of illustrated paperbacks designed specifically for classroom use. Suitable for upper elementary, junior high, or senior high school students. Among the titles now available are:

Latin America, by Robert Alexander. 1964. 155 p.

The Two Chinas, by Oliver Bell. 1964. 156 p.

The Middle East, by Jaeckel and Peretz. 1964. 156 p.

The Subcontinent of India, by Emil Lengyel. 1964. 155 p.

The Soviet Union, by Scholastic Book Service Editors. 1965. 160 p.

Man's World: A Physical Geography, by Richard E. Gross and Frank MacGraw. 1966. 160 p.

Measures of Problem-Solving Styles and Abilities

Acquisition and repetition of factual information is undoubtedly the easiest kind of learning to measure in the social studies or any other classroom. Ordinary achievement tests, however, can provide only a very limited measure of the success or failure in teaching strategies built around problem solving. Such strategies have as their goals not only the *product,* in terms of facts and understanding, but also modification of *process,* in terms of new ways of approaching and dealing with situations.

A search of the *Sixth Mental Measurements Yearbook* (The Gryphon Press, Highland Park, New Jersey, 1965), edited by Oscar K. Burros, indicates that the choice of tests for problem solving or critical thinking is quite limited. One test that readers may want to examine is the *Watson-Glaser Critical Thinking Appraisal,* published by Harcourt, Brace, and World. This instrument, which takes about an hour to administer, provides a total score and five sub-test scores. The five are: (1) inference, (2) recognition of assumptions, (3) deduction, (4) interpretation, and (5) evaluation of arguments. The test is suitable for Grades 9-16 and adults.

Another measure of critical thinking, under development at Cornell University, was reported by Sylvia Harrison and Robert Solomon in the May, 1964, issue of *Social Education.* Their article, "Review of Research in the Teaching of Social Studies: 1960-1963," indicated that the project had been hampered by the usual test construction difficulties and that the device was not ready for wide distribution and use. Since the Cornell test was designed for Grades 1-12, it is hoped that these difficulties can be overcome and another measure of critical thinking made available to researchers.

Until measures of all aspects of problem solving do become available, it will be necessary to rely on older and more limited means of assessment—such as achievement tests, ratings by teachers, interviews, and observations. These devices, while valuable to some extent, are always subject to great error and tend to be marginal research tools in the quest for new and more effective curricula and teaching strategies in the social studies.

SELECTED PUBLICATIONS OF THE NATIONAL COUNCIL FOR THE SOCIAL STUDIES

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Yearbooks

Fortieth Yearbook (1970), *Focus on Geography: Key Concepts and Teaching Strategies,* Phillip Bacon, ed. $5.50 (490-15264); cloth $7.00 (490-15266).

Thirty-Ninth Yearbook (1969), *Social Studies Curriculum Development: Prospects and Problems,* Dorothy McClure Fraser, ed. $4.50 (490-15240); cloth $5.50 (490-15242).

Thirty-Eighth Yearbook (1968), *International Dimensions in the Social Studies,* James M. Becker and Howard D. Mehlinger, editors. $4.50; clothbound $5.50.

Thirty-Seventh Yearbook (1967), *Effective Thinking in the Social Studies,* Jean Fair and Fannie R. Shaftel, editors. $4.00; clothbound $5.00.

Thirty-Sixth Yearbook (1966), *Political Science in the Social Studies,* Donald H. Riddle and Robert E. Cleary, editors. $4.00; clothbound $5.00.

Thirty-Fifth Yearbook (1965), *Evaluation in Social Studies,* Harry D. Berg, editor. $4.00; clothbound $5.00.

Thirty-Fourth Yearbook (1964), *New Perspectives in World History,* Shirley H. Engle, editor. $5.00; clothbound $6.00.

Thirty-Third Yearbook (1963); *Skill Development in Social Studies,* Helen McCracken Carpenter, editor. $4.00; clothbound $5.00.

Bulletins

Bulletin No. 45 (1971), *Concepts in the Social Studies,* Barry K. Beyer and Anthony N. Penna, editors. $2.25 (498-15248).

Bulletin No. 44 (1970), *Humanities and the Social Studies,* Thomas F. Powell, ed. $3.50 (498-15246).

Bulletin No. 43 (1969), *A Guide to Human Rights Education,* by Paul D. Hines and Leslie Wood. $2.25.

Bulletin No. 42 (1969), *American History Booklist For High Schools,* Ralph A. and Marian R. Brown, editors. $2.50.

Bulletin No. 41 (1968), *World Civilization Booklist: Supplementary Reading for Secondary Schools,* by the World Civilization Booklist Committee of NCSS; Morris Gall and Arthur F. Soderlind, Co-Chairmen. $3.50.

Bulletin No. 39 (1967), *Productivity and Automation,* J. J. Jehring, editor. $2.50.

Bulletin No. 38 (1966), *Reading Guide in Politics and Government,* by Robert H. Connery, Richard H. Leach, and Joseph Zikmund II. $1.50.

Bulletin No. 37 (1965), *The Study of Totalitarianism: An Inductive Approach* (A Guide for Teachers), by Howard D. Mehlinger. $2.00.

Other Publications

Drugs and Youth, Donald J. Wolk, ed. $2.25 (492-15296)

The American Citizens Handbook, Joy Elmer Morgan, ed. Cloth $6.00 (491-15216)

Promising Practices in Civic Education, Donald W. Robinson, *et al.* $4.00 (491-15172); cloth $5.00 (491-15174)

Test Item Bulletins

No. 40 (1968) *Teacher-made Test Items in American History: Emphasis Junior High School,* Dana Kurfman, ed. $2.00 (498-15204)

No. 6 (rev. ed., 1964) *Selected Test Items in American History,* Howard R. Anderson and E. F. Lindquist. Revised by Harriet Stull. $1.50 (498-14966)

No. 9 (rev. ed., 1960) *Selected Test Items in World History,* Howard R. Anderson and E. F. Lindquist. Revised by David K. Heenan. $1.50 (498-14968)

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